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The Relative Efficiency of Private and Public Schools: The Case of Thailand

Emmanuel Jimenez, Marlaine Lockheed, and Nongnuch Wattanawaha

Cost-effectiveness is a key consideration in the policy debate on the appropriate role of private schools in predominantly public school systems. This article analyzes the relative performance of public and private schools in Thailand in enhancing eighth grade student scores in standardized mathematics tests, given student background and school characteristics. Its main conclusion is that private schools are, on average, more effective and less costly than public schools in improving student performance in mathematics.

The relative efficiency of private and public schools has been the subject of a recent lively exchange in the literature. The issue is important because it has implications for the way that the public sector should finance education: whether it should provide only free public education or whether it should also subsidize private schools. In the United States, the debate was sparked by the Coleman, Hoffer, and Kilgore (1982) report, which concluded that private (Catholic) schools are more effective than public schools in helping students acquire cognitive skills. In developing countries, where tightening fiscal constraints have limited the ability of the public sector to expand its provision of free public education, research on this topic is just beginning (Psacharopoulos 1987; Cox and Jimenez 1987).

The debate is fueled by controversy over methodology, interpretation, and data. The most important methodological issue is the difficulty in attributing differences in the cognitive abilities of students in public and private schools to school inputs alone, because a variety of nonschool factors also affect achievement. These factors include socioeconomic background, innate ability, and...
individual motivation. Moreover, these nonschool factors also affect school choices made by families, such that students with one type of background and ability attend public schools, whereas students with different backgrounds and abilities attend private schools. Thus, unless nonschool factors are controlled appropriately, estimates of school effects will be contaminated by what has become known as “selectivity bias.” The problem is that the researcher's measures of these factors, particularly those that act as proxies for ability and motivation, are far from perfect. Modern statistical techniques help in controlling for this bias, although recent research has revealed that it is also important to keep track of one’s assumptions in modeling (see Murnane, Newstead, and Olsen 1985 for a careful assessment of the results of Coleman, Hoffer, and Kilgore and their critics).

Another shortcoming of the available literature is that the causal mechanisms underlying the differences in schooling outcomes for public and private schools have not been analyzed. What do public and private schools actually do that is different? Do they employ different input mixes (see Hannaway and Abramonitz 1985, and Chubb and Moe 1986 for some evidence from the United States)? If not, do they use the same input mix differently? Most important, does this behavior result in differences in the unit cost of providing education?

Finally, previous analyses of public/private school differentials have utilized only cross-sectional data, which do not allow for a direct measure of value added. If the achievement relationship (that is, the educational production function) holds at two points in time, it is possible when measuring outcomes to concentrate on exactly what happens educationally between those points. Differences in achievement can be related to specific inputs over a shorter time period. Moreover, the effect of omitted unmeasured factors, such as student ability or motivation, are lessened in the achievement–value added formulation compared with the level-of-achievement formulation. Any “level” effects of these unmeasured variables have already been incorporated into prior (for example, at the beginning of the school year) achievement. This does not mean that unmeasured variables no longer affect the estimating equation, but their effect is mitigated because only the “growth” effects of omitted variables such as innate ability would influence value added. Technically, the error term of a value added equation does not contain unmeasured personal characteristics that affect achievement similarly in both periods.

This study contributes to the literature in four dimensions. First, it extends the empirical evidence for developing countries by analyzing data from the Second International Mathematics Study (SIMS) conducted by the International Association for the Evaluation of Educational Achievement (IEA) in Thailand.

1. Several studies have attempted to use direct measures of ability based on tests specifically designed to measure innate ability (for example, an I.Q. test) rather than cognitive achievement (Psacharopoulos and Loxley 1985; Boissiere, Knight, and Sabot 1985, among others). Many analysts have questioned the validity of these tests in distinguishing between ability and achievement. In any case, no one has ever suggested that such tests fully control for both ability and motivation.
during the 1981–82 academic year. The only other rigorous comparisons of achievement in public and private schools in developing countries have been conducted in Kenya (Armitage and Sabot 1987), Colombia, and Tanzania (Psacharopoulos 1987; Cox and Jimenez 1987).

Second, to our knowledge, this is one of the first comparative studies, in developing or developed countries, of public versus private achievement that uses longitudinal data. (See Coleman and Hoffer 1987 for a recently published analysis using U.S. data.) In SIMS, students were tested at the beginning and end of the eighth grade school year. Thus we were able to obtain better controls for unmeasured variables because the data base contains a direct measure of value added of a year of schooling. (See Mellow 1981 for a similar evaluation of cross-sectional versus longitudinal estimates using the example of the impact of unions on wages.)

Third, the study also confronts the difficult methodological questions that have arisen in other studies. An individual's status as a public or private school student is a choice made by student and parent. If this choice is systematically correlated with personal characteristics, there may be sample selection bias. We use some recent methodological advances to model the effect of student and school characteristics on value added and to control statistically for the possibility of selection bias.

Fourth, we make further inquiries into the nature and consequences of public/private differentials in school achievement. In particular, we document differences in the availability and use of school inputs for public and private schools. Then we compare unit costs of public and private schools, before reaching conclusions on the relative efficiency (as opposed to the relative productivity) of public and private schools.

I. The Basic Value Added Model

Factors that affect student achievement can be quantified through the use of statistical inference. The ith pupil's score in the eighth grade mathematics achievement test is characterized by the following equation:

\[ A_{i8} = a_0 + a'X_{i8} + a'X_{i7} + \cdots + a'X_{it} + c'Z_i + d'I_i + u_{i8}, \]

and the ith pupil's score in the seventh grade test can be similarly expressed as follows:

\[ A_{i7} = b_0 + b'X_{i7} + b'X_{i6} + \cdots + b'X_{it} + c'Z_i + d'I_i + u_{i7}. \]

The terms in equations 1 and 2 are defined as follows. \( A_{it} \) = achievement score of the ith child at the end of school year t (that is, 7 or 8). \( X_{it} \) = a vector of variables describing the ith child's learning environment during school year t (for example, out-of-school tutoring, parental encouragement, availability of study materials at home, characteristics of teachers, other school-related characteristics specific to year t, peer characteristics); the vector describing learning
environment can be partitioned into a school-related vector \((S)\) and a child or household-related vector \((H)\), or \(X_i = [X_{is} X_{ih}]\). \(Z_i\) = a vector of variables affecting achievement which is invariant over time (for example, quality of the home environment or parental inputs such as parents' education, student's educational expectations, and student characteristics such as sex and age). \(I_i\) = a vector of variables describing unobserved influences (for example, innate ability or preschool care). The term \(u_i\) = a random disturbance term with a zero mean and a variance \(\sigma^2\). The term \(a' = a\) vector of coefficients describing the effect on achievement at the end of the eighth grade of a unit change in the child's environment in school year \(t\) (for example, \(a_7\) is the marginal effect on eighth grade achievement of environmental characteristics during the seventh grade). The term \(b'\) is similar to \(a'\), but describes the effect on achievement at the end of the seventh grade. The term \(c'\) = a vector of coefficients of the effect on eighth grade achievement of a unit change in one of the \(Z\) variables. The term \(d\) = the effect on achievement of a unit change in the unobserved component. The prime symbol (') = an indication of a transposition of a column vector to a row vector.

It is not feasible to estimate equation 1 or 2 because researchers rarely have much information on past characteristics, such as class size or parental tutoring four or five years earlier. An alternative is to estimate equations 1 and 2 as value added equations by subtracting equation 2 from equation 1 (see Hanushek 1986 for a more thorough review of the arguments). The resulting equation could greatly simplify the specification if some of the \(X_i\) terms are canceled out. However, for this to happen, additional assumptions are necessary. Boardman and Murnane (1979) have demonstrated the importance of deriving the empirical form of the value added equations carefully because each specification imposes behavioral restrictions.

The specifications in equations 1 and 2 imply that school and student characteristics in previous years also affect current achievement. For example, the size of a student's class in the seventh grade on down to the first grade affects his/her eighth grade achievement. However, we do not expect characteristics in previous years to have the same effect on current-period achievement as current-period characteristics. A more reasonable expectation is that the effect of past characteristics on current achievement diminishes over time. If this effect diminishes geometrically, then a simple value added equation can be derived from equations 1 and 2.

Let the unsubscripted variables \(a\), \(c\), and \(d\) represent the “true” current-period effect on school achievement of a unit change in a component of \(X\), \(Z\) and \(I\), respectively. For example, \(a\) is the effect on eighth grade achievement of an increase in one unit of class size during the eighth grade, or \(a_8 = a\). Let \(f\) be the amount by which the effect of seventh grade characteristics on eighth grade achievement diminishes relative to \(a\), or \(a_7 = (f)a^2\). The critical assumption is

2. We would expect \(f < 1\). However, this is not a restriction because \(f\) is a parameter to be estimated. In the unlikely event that the estimated \(f > 1\), we conclude that past characteristics have greater importance than current-period characteristics in explaining current achievement.
that the effect of previous years diminishes geometrically thereafter, or 
\( a_n = (f^2)a_1, \ldots, a_1 = (f^7)a, \) for \( f < 1. \) By similar reasoning, the impact of previous years' characteristics on seventh grade achievement is 
\( b_7 = a, b_6 = (f)a, \ldots, b_1 = (f^6)a. \) These definitions can then be substituted into equations 1 and 2. Then, if equation 2 is multiplied by \( f \) before it is subtracted from equation 1, and terms are canceled out, the following simple specification is obtained:

\[
A_{i8} = g_0 + g_1A_{i7} + g_2X_{i8} + g_3Z_i + e_{i8},
\]

where \( g_0 = (a_0 - fb_0), g_1 = f, g_2 = a', g_3 = c'(1 - f), \) and \( e_{i8} = d'(1 - f)l_i + (u_{i8} - fu_{i7}). \) This estimating equation is intuitively appealing because the terms describing previous environments \( (X_{it}, t = 1, \ldots, 7) \) are deleted and the (unrestricted) coefficient of \( A_{i7} \) can be easily interpreted as \( f. \)

In this study we use equation 3 as the final estimating form. However, several econometric issues require further discussion. First, it is important to distinguish between variables that change during the eighth grade (and thus belong to the \( X \) vector) and those that are invariant over the child's schooling career (and thus belong to the \( Z \) vector). The coefficient of a \( Z \)-type variable (such as student sex) cannot be interpreted as the marginal effect on eighth grade achievement; rather, the coefficient is the marginal effect on eighth grade achievement less its effect on achievement in the seventh grade.

Second, the use of the lagged dependent variable in equation 3 could introduce technical problems: \( A_{i7} \) has a random component, and it may be correlated with the error term. We can invoke additional restrictions regarding the error structure to address these problems.3 Moreover, we argue that regardless of these restrictions, any remaining technical biases would not change our main results regarding differential achievement of private and public schools because both types of schools would be equally affected.

Third, the use of value added does not necessarily make the problem of omitting unobserved variables go away—although we would expect the problem to be mitigated. The problem is important if variables such as ability and motivation are correlated with the \( X \) and \( Z \) terms (for example, more able children are given more attention at school and at home). The coefficient of the measured variable would be biased upward or downward, depending on its correlation with the unmeasured \( I \) variable. Because we are focusing on one particular environmental effect—the public versus private dimension—the problem can be couched in terms of selection bias. If students are systematically selected (or self-selected) into public or private schools on the basis of some unobserved criterion (such as ability), estimates of achievement within each

---

3. We assume that this year's persistent error will be some fraction of last year's persistent error (that observations with large positive or negative errors this year will be likely next year to have errors closer to zero—smaller in absolute value, or \( U_{it} = uU_{i7}, \) where \( u < 1). \) If \( u = f, \) then that part of the error term in equation 3 that contains the persistent effects collapses to a random variable with zero mean and the autocorrelation problem is solved. In any event, the bias associated with autocorrelation of the persistent effects ought to be empirically quite small and should be dominated by the random component and our large sample (see Theil 1971, chap. 8).
school type would be contaminated by this selection effect. This problem is corrected using recently developed statistical techniques.

II. Data

Sample

The IEA SIMS sample comprised 99 mathematics teachers and their 4,030 eighth grade students and was derived from a two-stage, stratified random sample of classrooms. The primary sampling units were the twelve national educational regions of Thailand plus Bangkok. Within each region, a random sample of lower-secondary schools was selected, along with replacements. At the second stage, a random sample of one class per school was selected from a list of all eighth grade mathematics classes within the school. The resulting sample represented 1 percent of eighth grade mathematics classrooms within each region. This article reports data on the 3,265 students for whom complete data were available.

A mathematics test covering five curriculum content areas (arithmetic, algebra, geometry, statistics, and measurement) was administered to students at both the beginning (pretest) and end (posttest) of the school year. Students also completed a short background questionnaire at the pretest and a longer one at the posttest administration. Teachers completed several survey instruments at the posttest, including questionnaires on their background, teaching practices, and characteristics of their randomly selected “target” class. Data about the school were provided by a school administrator and were supplemented with information provided by the Ministry of Education.

Mathematics Achievement

The IEA developed five mathematics tests for use in SIMS. One test was a forty-item instrument called the core test. The remaining four tests were thirty-five-item instruments called rotated forms. These five test instruments contained roughly equal proportions of items from each of the five curriculum content areas, except that the core test contained no statistics items (Wattanawaha 1986). For the purposes of this analysis, we regard the instruments as parallel forms with respect to mathematics content.

The IEA longitudinal design called for Thai students to be pretested using both the core test and one randomly selected rotated-form test. At the posttest, students again took the core test and a rotated-form test different from that taken at the pretest. Approximately equal numbers of students took each of the rotated-form tests in both test administrations.

One goal of our analysis was to predict posttest achievement as a function of pretest performance plus other determinants. Because students took the core form twice, the core-form posttest scores reflect, to some degree, familiarity
with the core-test items. Thus we analyzed scores from the rotated forms, after they were equated to adjust for differences in test length and difficulty. In this analysis, we used equated rotated-form formula scores for both pretest and posttest measures of student mathematics achievement. A complete description of the equating procedure is provided in Lockheed, Vail, and Fuller (1986).

**Student Background Characteristics**

To conform with the value added model outlined above, student characteristics were divided into two categories: time-invariant or fixed \(Z\) and variable or eighth grade specific \(X_{age}\). Fixed background information about each student included sex, age, enrollment in a coeducational or single-sex school, number of older siblings, maternal educational status, paternal occupational status,\(^4\) educational expectations, and correspondence between home language and language of instruction. Definitions and categories for each of these variables are provided in table 1.

Student characteristics thought to vary over the course of the school year include amount of out-of-school tutoring, perceived parental encouragement, and home use of a four-function calculator (a proxy for family educational resources). Parental encouragement was measured by an index comprising four items of the type “My mother thinks that learning mathematics is very important for me,” with a five-point Likert-type response alternative ranging from 1 = “exactly like” to 5 = “not at all like.” On this index, a low score represents high parental encouragement.

**Peer Group, Class, Teacher, and School Characteristics**

We use three measures of a student’s peer group characteristics: average pretest score, proportion of classmates whose mothers have more than a primary-school education, and proportion of classmates whose fathers have professional occupations. Class characteristics include class size, “enriched” or “nonenriched” curriculum, and single-sex or coeducational mathematics class (as opposed to the school). Teacher background characteristics include sex and participation in in-service training. Teacher classroom teaching practices include using workbooks, maintaining discipline, and administering tests and quizzes. School characteristics include regional per capita income, school size, public or private status, single-sex or coeducational status, and proportion of teachers certified to teach mathematics. Definitions and categories for these variables are provided in the discussion of the nature of the public/private school differential.

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4. Because the correlations between paternal and maternal occupational status \(r = 0.39\) and paternal and maternal educational attainment \(r = 0.58\) were high, we analyzed the effects of paternal occupational status and maternal educational attainment only. There were also fewer missing cases for these variables.
Table 1. Student Background and Achievement in Private and Public Schools in Thailand, 1981–82

<table>
<thead>
<tr>
<th>Variable description</th>
<th>Private</th>
<th>Public</th>
</tr>
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<tr>
<td>Achievement score after eighth grade ($A_{8}$)</td>
<td>13.639</td>
<td>12.253</td>
</tr>
<tr>
<td>(10.417)</td>
<td>(8.958)</td>
<td></td>
</tr>
<tr>
<td>Achievement score after seventh grade ($A_{7}$)</td>
<td>10.865</td>
<td>8.836</td>
</tr>
<tr>
<td>(9.248)</td>
<td>(7.473)</td>
<td></td>
</tr>
<tr>
<td>Time-invariant background ($Z_{i}$), (dummy = 1 if)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Father's occupation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unskilled</td>
<td>0.149</td>
<td>0.147</td>
</tr>
<tr>
<td>Skilled</td>
<td>0.238</td>
<td>0.478</td>
</tr>
<tr>
<td>Clerical</td>
<td>0.427</td>
<td>0.230</td>
</tr>
<tr>
<td>Professional</td>
<td>0.185</td>
<td>0.145</td>
</tr>
<tr>
<td>Mother's education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>0.234</td>
<td>0.261</td>
</tr>
<tr>
<td>Primary</td>
<td>0.529</td>
<td>0.592</td>
</tr>
<tr>
<td>Secondary</td>
<td>0.127</td>
<td>0.087</td>
</tr>
<tr>
<td>University</td>
<td>0.110</td>
<td>0.060</td>
</tr>
<tr>
<td>Educational expectations</td>
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<td></td>
</tr>
<tr>
<td>&lt; 2 more years</td>
<td>0.049</td>
<td>0.080</td>
</tr>
<tr>
<td>2–5 more years</td>
<td>0.291</td>
<td>0.302</td>
</tr>
<tr>
<td>5–8 more years</td>
<td>0.384</td>
<td>0.411</td>
</tr>
<tr>
<td>&gt; 8 more years</td>
<td>0.276</td>
<td>0.207</td>
</tr>
<tr>
<td>Eldest child</td>
<td>0.212</td>
<td>0.224</td>
</tr>
<tr>
<td>Child in single-sex school</td>
<td>0.416</td>
<td>0.146</td>
</tr>
<tr>
<td>Female child</td>
<td>0.518</td>
<td>0.477</td>
</tr>
<tr>
<td>Gender by school-type interactions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female in single-sex school/grade</td>
<td>0.22</td>
<td>0.08</td>
</tr>
<tr>
<td>Female in coed school/grade</td>
<td>0.30</td>
<td>0.39</td>
</tr>
<tr>
<td>Male in single-sex school/grade</td>
<td>0.14</td>
<td>0.10</td>
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<tr>
<td>Male in coed school/grade</td>
<td>0.35</td>
<td>0.42</td>
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<tr>
<td>Gender by classroom-type interactions</td>
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<tr>
<td>Female in single-sex class</td>
<td>0.29</td>
<td>0.13</td>
</tr>
<tr>
<td>Female in coed class</td>
<td>0.23</td>
<td>0.35</td>
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<tr>
<td>Male in single-sex class</td>
<td>0.27</td>
<td>0.15</td>
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<tr>
<td>Male in coed class</td>
<td>0.21</td>
<td>0.47</td>
</tr>
<tr>
<td>Language of instruction also used at home</td>
<td>0.654</td>
<td>0.444</td>
</tr>
<tr>
<td>Age in months</td>
<td>169.570</td>
<td>171.160</td>
</tr>
<tr>
<td>(10.848)</td>
<td>(8.372)</td>
<td></td>
</tr>
<tr>
<td>Background during eighth grade ($X_{8t}$)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hours of extra tutoring</td>
<td>1.686</td>
<td>1.653</td>
</tr>
<tr>
<td>(2.685)</td>
<td>(2.929)</td>
<td></td>
</tr>
<tr>
<td>Index of parental encouragement (1 = high; 5 = low)</td>
<td>2.130</td>
<td>2.092</td>
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<tr>
<td>(0.898)</td>
<td>(0.943)</td>
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<tr>
<td>Home use of four-function calculator (dummy = 1)</td>
<td>0.405</td>
<td>0.266</td>
</tr>
<tr>
<td>Lambda</td>
<td>1.367</td>
<td>-0.264</td>
</tr>
<tr>
<td>Number of observations</td>
<td>527</td>
<td>2,738</td>
</tr>
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</table>

Note: Numbers in parentheses are standard deviations for continuous variables.
III. The Effect of Background on Achievement in Public and Private Schools

A critical policy issue is whether a student randomly chosen from the general population would do better in a public or a private school. According to table 1, the average test score is 24 percent higher at the beginning of eighth grade and 12 percent higher at the end of eighth grade for students in private schools than for students in public schools. These magnitudes imply that the gross measure of value added during eighth grade—posttest less pretest scores—is higher for public schools. However, because students in public and private schools are different, these gross figures should not be used to conclude that one school type is more or less effective than the other.

For two reasons, the impact of background on achievement gain can reinforce or counteract the private/public differential, as measured by gross value added. First, it is not unambiguously clear that students from one type of school (public or private) have characteristics that would give them an advantage in mathematics achievement gain (as opposed to achievement level) over students in the other type of school. Several indicators from our sample do point to a slight background advantage for students in private schools, which charge higher fees. Approximately 48 percent of public school students had fathers with blue collar, semiskilled occupations, and 23 percent had fathers with white collar, clerical occupations, compared with 24 percent and 42 percent, respectively, for private school students. Also, a greater proportion of private school students than public school students had mothers with a secondary-school education or above (25 percent versus 15 percent) and had higher expectations regarding further education (28 percent of them expected to attend eight more years of schooling, that is, finish college, as opposed to 21 percent for public school students). These differences are reflected in the private school students' access to extra-school inputs: more home use of calculators and out-of-school tutoring. However, private school students perceived receiving less parental encouragement for mathematics. A priori, therefore, we cannot be certain how background will affect achievement gain.

Second, even if private school students come from more advantaged backgrounds, such characteristics could still reverse the uncorrected advantage of public schools in achievement gain (as opposed to achievement level). If the impact of background on achievement diminishes at higher grades, the achievement gain of the school type attended by advantaged students would be understated. For example, suppose that private school students enjoyed an unambiguous background advantage relative to public school students. Holding constant for background would increase private school achievement gain relative to that in public schools.

Thus, the impact of background on achievement gain is complex and cannot be gleaned from a simple comparison of average indicators. In the next section we show our method for taking the impact of background into account.
Controlling for Background

To control for student or household characteristics (such as socioeconomic status and ability) when comparing achievement test scores, we use the value added achievement model developed earlier. We estimate equation 3 separately for students in public and private schools, under the assumption that they come from different populations:\footnote{Alternatively, equation 3 can be estimated as one equation, with a dummy variable for private and public schools. However, statistical (F-) tests lead us to reject the hypothesis that the coefficients of all the other variables are equivalent in both types of schools. Results are available from the authors.}

\begin{align}
\Delta a & = \bar{g}_0 + \bar{g}_1 \Delta \theta + \bar{g}_2 \bar{X}_{BH} + \bar{g}_3 \bar{Z}_i + \bar{a}_s \\
\hat{\Delta a} & = \hat{g}_0 + \hat{g}_1 \hat{\Delta} \theta + \hat{g}_2 \hat{X}_{BH} + \hat{g}_3 \hat{Z}_i + \hat{a}_s,
\end{align}

where the symbols $\bar{\cdot}$ and $\hat{\cdot}$ represent private and public schools, respectively. Note that only the household subvector (subscripted by $H$) of $X$ is of concern in this section.

Ordinary least squares (OLS) regressions on equations 3a and 3b for public and private school students might lead to misleading results because of selection bias. Suppose that students are free to choose the type of school they prefer. One type of selection results if students sort themselves into the type of institution they think will maximize their performance. There would be positive selection in both private and public school samples. Another alternative is that students are hierarchically sorted. For example, if there is excess demand for enrollment in public schools and the best students are selected, there would be positive selection into public schools but negative selection into private ones. In neither case can the analyst observe the characteristics of private school students among the public school sample or vice versa. Because the subsamples would not be a random draw from the student population, the assumptions of the basic linear model could lead to biased estimates of the achievement effect.\footnote{The presence of $I$ as a component of $e$ is the critical factor in this problem. If there were no unmeasurable influences on achievement, or if unmeasurable effects were uncorrelated with school type, as well as with other components of $Z$ and $X$, there would be no selection bias. Present samples would be random draws from the population. Of course, costly strict experimental designs would also obviate this problem (that is, if students were assigned randomly to public and private schools). Also, the selectivity correction does not address any possible problems caused by the lagged dependent variable (see footnote 3).}

To correct for sample selection, we use the standard two-step methodology (see Heckman 1979; Lee 1979; and Willis and Rosen 1979 for theory and applications). The first step in this methodology is to estimate what determines the choice of type of school. We assume that individuals (typically parents) will choose an educational plan, including the selection of public or private school, that maximizes the child's lifetime earnings, net of tuition costs. The solution
to this problem can be shown to result in the following choice equation for the
ith child (Cox and Jimenez 1987):
\[ J_i^* = k_0 + k_1 Y_i + \epsilon_i , \]
where \( J_i^* \) is an unobserved variable which characterizes the propensity of a
household to choose a certain type of school. Because it is unobserved, we use
the indicator variable \( J_i = 1 \) if \( J_i^* > 0 \); otherwise, \( J_i = 0 \). \( Y_i \) indicates the
explanatory variables \( k_0 \) and \( k_1 \) are parameters to be estimated, and \( \epsilon_i \) is a
random error term.

The second step is to use the results of the first step to correct for the
selection bias in equations 3a and 3b. With selection bias, the expected values
of \( A_i \) are conditional on the choice of public or private school. This means that
the error term \( e_i \) is correlated with \( \epsilon_i \). The expected value of \( e_i \) will no longer
be equal to zero, and the estimated parameters in equations 3a and 3b will
suffer from omitted variable bias if OLS is applied. If we assume that \( \epsilon_i \) and \( e_i \)
are jointly distributed with mean zero and finite moments, then the estimated
(by OLS) parameters of the following equations will be consistent:

\[ \begin{align*}
(5a) \quad \bar{A}_{ib} &= \bar{g}_0 + \bar{g}_1 \bar{A}_{ib'} + \bar{g}_2 \bar{X}_{ib} + \bar{g}_3 \bar{Z}_i + \bar{g}_4 \lambda_i \\
(5b) \quad \bar{A}_{ib} &= \bar{g}_0 + \bar{g}_1 \bar{A}_{ib'} + \bar{g}_2 \bar{X}_{ib} + \bar{g}_3 \bar{Z}_i + \bar{g}_4 \lambda_i .
\end{align*} \]

The estimated equations 5a and 5b are similar to equations 3a and 3b except
for the inclusion of the last term. The term \( \lambda_i \) is a Mills ratio: the numerator is the
ordinate of the standard normal at \( J_i \), and the denominator is the probabil-
ity of being in the sample; both are calculated from the first-stage probit
equation. Including \( \lambda_i \) in equations 5a and 5b enables us to treat the selection
bias as an omitted-variable problem. Then \( \lambda_i \) times its OLS coefficient \( g_4 \) can be
interpreted as the direction and magnitude of selection bias in each of the
public and private school achievement equations. The estimation of equations
3a and 3b by OLS would be consistent (unbiased) because, in theory, the
equations hold constant for the probability of being selected in one subsample
or another.\(^7\)

\[^7\text{This result is now well established in the literature (see Heckman 1979; Lee 1979; Willis and Rosen 1979). Madalla (1983) has called the version of the procedure used here a switching regression model.}\]

\[^8\text{This can be shown as follows: In equation 3a, } E(\epsilon_i | J_i > 0) = E(\epsilon_i | \epsilon_i > -k_0 - k_1 Y_i) = (\sigma_{\epsilon_0}/\sigma_{\epsilon_n}) E[\epsilon_i/\sigma_{\epsilon_n}] E[\epsilon_i/\sigma_{\epsilon_n}] = (\sigma_{\epsilon_0}/\sigma_{\epsilon_n}) [f(k_0 + k_1 Y_i/\sigma_{\epsilon_n})/F(k_0 + k_1 Y_i/\sigma_{\epsilon_n})], \text{ where } \sigma_{\epsilon_0} \text{ represents the covariance between the error terms of the choice and achievement equations, } \sigma_{\epsilon_n} \text{ is the standard error of the choice equation, and } f(.) \text{ and } F(.) \text{ are, respectively, the probability and cumulative density functions of the choice equation. The last expression can be rewritten as } \tilde{g}_4 \lambda_i, \text{ where } \tilde{g}_4 = (\sigma_{\epsilon_0}/\sigma_{\epsilon_n}) \text{ and } \lambda_i = \{ \cdot \}. \text{ Similarly in equation 3b, } E(\epsilon_i | J_i < 0) = (\sigma_{\epsilon_0}/\sigma_{\epsilon_n}) [f(-k_0 + k_1 Y_i/\sigma_{\epsilon_n})/1 - F(-k_0 + k_1 Y_i/\sigma_{\epsilon_n})], \text{ where } \tilde{g}_4 = (\sigma_{\epsilon_0}/\sigma_{\epsilon_n}) \text{ and } \lambda_i = \{ \cdot \}. \text{ Note that, by definition, } \lambda_i > 0 \text{ and } \lambda_i < 0. \text{ These definitions, consistent with those in Willis and Rosen (1979), are used by our software package.}\]
What Determines the Choice of School Type?

The first step in the estimation technique is to perform a regression analysis of private school choice with variables that measure socioeconomic characteristics of the student and coeducational/single-sex school type. The results are presented in table 2. The most significant variables in determining private school choice are home language and school type (that is, single sex or coeducational) by sex of student. One strong effect on the choice of private schools is a correspondence between the home language and the language of instruction. Another strong effect is related to the interaction between student sex and a student's prior decision to attend a single-sex or coeducational school. Girls who selected single-sex schools are more likely to choose private schools, whereas girls who selected coeducational schools tend to choose public schools. Whether the school is single-sex or coeducational appears to have little effect on male choice of private or public schools, however. When student sex and single-sex/coeducational school type are held constant, few other background characteristics have an effect on choice. Paternal occupational status is inconsistently related to school choice: in comparison with students whose fathers are employed in unskilled occupations, students with fathers in white collar, clerical occupations are more likely to choose private schools whereas those

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficients</th>
<th>t-statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>20.209</td>
<td>4.555</td>
</tr>
<tr>
<td>Father's occupation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skilled</td>
<td>-0.280</td>
<td>-3.276</td>
</tr>
<tr>
<td>Clerical</td>
<td>0.254</td>
<td>2.968</td>
</tr>
<tr>
<td>Professional</td>
<td>-0.024</td>
<td>-0.230</td>
</tr>
<tr>
<td>Mother's education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>-0.056</td>
<td>-0.831</td>
</tr>
<tr>
<td>Secondary</td>
<td>0.016</td>
<td>0.153</td>
</tr>
<tr>
<td>University</td>
<td>0.009</td>
<td>0.074</td>
</tr>
<tr>
<td>Educational expectations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5-8 more years</td>
<td>-0.066</td>
<td>-1.021</td>
</tr>
<tr>
<td>&gt; 8 more years</td>
<td>0.025</td>
<td>0.326</td>
</tr>
<tr>
<td>Age</td>
<td>-0.245</td>
<td>-4.814</td>
</tr>
<tr>
<td>Age squared</td>
<td>0.001</td>
<td>4.786</td>
</tr>
<tr>
<td>Eldest child</td>
<td>-0.131</td>
<td>-1.906</td>
</tr>
<tr>
<td>Language of instruction also used at home</td>
<td>0.413</td>
<td>7.056</td>
</tr>
<tr>
<td>Male in single-sex school/grade</td>
<td>0.145</td>
<td>1.561</td>
</tr>
<tr>
<td>Female in single-sex school/grade</td>
<td>0.594</td>
<td>6.497</td>
</tr>
<tr>
<td>Female in coed school/grade</td>
<td>-0.134</td>
<td>-2.034</td>
</tr>
<tr>
<td>Number of observations</td>
<td>3,265</td>
<td></td>
</tr>
<tr>
<td>Log likelihood</td>
<td>-1,307.9</td>
<td></td>
</tr>
</tbody>
</table>
with fathers in skilled, blue collar occupations are less likely to do so. Maternal education has no effect on private school choice. Thus the relationship between parental status and choice of school is not strictly monotonic, and low socioeconomic status groups are well represented in private schools. There is thus likely to be a great variance in the quality of private institutions, a point that is discussed further in the next section. Finally, first-born children tend to be enrolled in public schools, as are older students, suggesting that repetition rates may be higher in public schools.

The parameters of the probit equation presented in table 2 can now be used to estimate the term that will be used to correct for the selection bias. The average \( \lambda \) in equations 5a and 5b is shown in the penultimate row of table 1.

How Does Socioeconomic Background Affect School Achievement?

The variables used to explain achievement scores in Thailand (that is, the vectors \( X_{8H} \) and \( Z_i \)) include many of the same variables used in table 2 to explain choice of private or public school. However, the variables represented by \( X_{8H} \) should affect achievement scores only, because the choice of a private or a public school was made well before the student started eighth grade. The \( X_{8H} \) set includes variables that measure parental encouragement of mathematics, out-of-school tutoring during eighth grade, and the availability at home of instructional aids such as calculators.

Although very few classes in this sample are from single-sex schools or grade levels (five private schools, thirteen public schools), considerably more mathematics classes are single sex (eight in private schools and twenty-two in public schools). After holding student sex and single sex/coeducational school type constant, we expect to find systematic differences in test scores between boys and girls in single-sex and coeducational classes. We expect that girls will profit from single-sex classes, whereas boys will profit from coeducational classes, other things being equal. This expectation is based on previous research documenting sex differences in teacher-student and peer interaction in coeducational mathematics classes (see Lockheed and others 1985 for a recent review). Thus, coeducational status in the classroom (and its interaction with student sex) is included in the list of explanatory variables of achievement. This implies that coeducational status in the school (or grade level) acts as the exclusion restriction that enables us to identify the probit and achievement equations.

Finally, the achievement equation includes a term that holds constant for the selection bias, that is, for the probability that a given student will be in a private school. This term is derived from parameters in the choice equation, as described earlier.

The estimated achievement equations 3a and 3b are presented in table 3 for private and public school students, respectively. These equations can be used to estimate whether a school achievement advantage exists in the public or private sector, after holding constant for student background and private or public school selection.
Table 3. Achievement Functions for Private and Public Schools in Thailand, 1981–82

<table>
<thead>
<tr>
<th>Variable description</th>
<th>Coefficients</th>
<th></th>
<th>Coefficients</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Private</td>
<td>t-statistics</td>
<td>Public</td>
<td>t-statistics</td>
</tr>
<tr>
<td>Constant</td>
<td>-99.810</td>
<td>-1.688</td>
<td>-79.710</td>
<td>-2.418</td>
</tr>
<tr>
<td>Past achievement</td>
<td>0.729</td>
<td>19.983</td>
<td>0.778</td>
<td>45.287</td>
</tr>
<tr>
<td>Time-invariant background (Zi)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Father's occupation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skilled</td>
<td>1.914</td>
<td>1.717</td>
<td>0.930</td>
<td>2.296</td>
</tr>
<tr>
<td>Clerical</td>
<td>-1.991</td>
<td>-1.949</td>
<td>-0.912</td>
<td>-1.970</td>
</tr>
<tr>
<td>Professional</td>
<td>-0.121</td>
<td>-0.112</td>
<td>0.544</td>
<td>1.150</td>
</tr>
<tr>
<td>Mother's education</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>0.432</td>
<td>0.596</td>
<td>0.799</td>
<td>2.715</td>
</tr>
<tr>
<td>Secondary</td>
<td>-1.255</td>
<td>-1.189</td>
<td>0.830</td>
<td>1.687</td>
</tr>
<tr>
<td>University</td>
<td>0.107</td>
<td>0.084</td>
<td>0.156</td>
<td>0.265</td>
</tr>
<tr>
<td>Educational expectations</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5–8 more years</td>
<td>1.105</td>
<td>1.570</td>
<td>1.189</td>
<td>4.150</td>
</tr>
<tr>
<td>&gt; 8 more years</td>
<td>1.172</td>
<td>1.473</td>
<td>1.636</td>
<td>4.636</td>
</tr>
<tr>
<td>Age</td>
<td>1.466</td>
<td>2.073</td>
<td>1.014</td>
<td>2.705</td>
</tr>
<tr>
<td>Age squared</td>
<td>-0.004</td>
<td>-2.173</td>
<td>-0.003</td>
<td>-2.889</td>
</tr>
<tr>
<td>Eldest child</td>
<td>0.382</td>
<td>0.518</td>
<td>0.027</td>
<td>0.085</td>
</tr>
<tr>
<td>Language of instruction also used at home</td>
<td>-2.650</td>
<td>-2.717</td>
<td>-0.810</td>
<td>-2.213</td>
</tr>
<tr>
<td>Male in single-sex class</td>
<td>-3.301</td>
<td>-3.694</td>
<td>-1.509</td>
<td>-3.972</td>
</tr>
<tr>
<td>Female in single-sex class</td>
<td>-2.833</td>
<td>-2.415</td>
<td>-1.138</td>
<td>-2.300</td>
</tr>
<tr>
<td>Female in coed class</td>
<td>0.439</td>
<td>0.499</td>
<td>-0.602</td>
<td>-1.933</td>
</tr>
<tr>
<td>Background during eighth grade (X_{8th})</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tutoring</td>
<td>-0.150</td>
<td>-1.358</td>
<td>-0.064</td>
<td>-1.542</td>
</tr>
<tr>
<td>Parental encouragement</td>
<td>0.181</td>
<td>0.552</td>
<td>0.070</td>
<td>0.525</td>
</tr>
<tr>
<td>Home calculator</td>
<td>0.340</td>
<td>0.540</td>
<td>0.234</td>
<td>0.833</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.607</td>
<td></td>
<td>0.488</td>
<td></td>
</tr>
<tr>
<td>F-statistics</td>
<td>39.163</td>
<td></td>
<td>129.485</td>
<td></td>
</tr>
</tbody>
</table>

As explained earlier, the interpretation of the coefficients of the stock variables (Zi) differs from that of the flow variables (X_{8th}). The effects of the stock variables are nonmarginal; they represent the cumulative effects on past achievement as well: c(1 - f), where f is the lagged effect of previous inputs on current-year achievements. The estimate of f is 0.73 for private schools and 0.78 for public schools.

Students whose fathers were in skilled jobs tended to do better than students whose fathers were in unskilled occupations. However, those with fathers in professional or clerical jobs did not score significantly higher. These trends hold for both public and private school students. Mother's educational attainment (reference category: no education) and student's educational expectation (reference category: less than five more years of school) variables are all insignificant for the private school subsample but are significant and generally exhibit the expected positive sign for the public school subsample. One expla-
nation for this difference is that private school students are relatively homogeneous—once they have chosen private schools, home environment does not affect achievement. They may also be more highly motivated than public school students, and a “marginal increment” in motivation will not be as important in affecting achievement. Older students outperform younger students in both public and private schools, but being the eldest child in the family has no effect on achievement. Speaking the language of instruction at home is negatively related to achievement for both groups. (One possible explanation is that Chinese-speaking students do better in school than Thai-speaking students, although we had no data on ethnicity to test this hypothesis.) Boys in coeducational classes do better in mathematics than both boys and girls in single-sex classes; the differences are particularly pronounced in private institutions. However, within private coeducational institutions boys do not outperform girls, and within public coeducational institutions boys only slightly outperform girls. Thus, the male advantage in mathematics performance is sensitive to classroom setting.

Table 3 also presents regression results for three flow variables: out-of-school tutoring, parental encouragement, and home use of a four-function calculator. None of these variables has a significant effect on achievement.

The selection term (coefficient of Lambda times its mean) is negative for private schools and positive for public schools. This indicates that, if any school system “skims the cream,” it is the public schools. Whereas private school students tend to come from slightly more elevated social status (clerical workers), the effect of parental occupational status is apparently offset by other variables, principally educational aspirations.

With Background Held Constant, Is There a Private School Effect?

The estimated differential in public and private school students' achievement scores can be computed from the parameters presented in table 3 to hold constant for the effect of background. Because private and public school achievement equations differ in terms of intercept and slope, the comparison would be affected by the values of the other explanatory variables, as well as by the coefficients in these equations. To clarify this, we compute the following unconditional private school effect: From the entire sample of private and public students, consider a randomly chosen pupil with the average characteristics of a public school student (that is, standardized according to the public school means). The unconditional effect measures the increment (or decrement) in the student's test score had the student gone to a private school. 9 The same calculations can be performed standardizing at the private school means. The question then would be, how would a pupil with the average characteristics of a private school student have done had he/she gone to public school? There is

9. This unconditional effect nets out the selection term from both the public and private school equations in calculating school effects. In contrast, the conditional private school effect retains the selection term in calculating school effects.
no theoretical reason to prefer one method of standardization over another. However, there is no guarantee that the results will be consistent with one another. The results are summarized in table 4.

The results presented in the top panel of table 4 indicate that, after holding constant for past achievement and socioeconomic background, eighth grade students in private schools have an unconditional advantage in mathematics test performance of about fifteen points. This implies that a Thai eighth grade student with the background of an average private school student, chosen randomly from the population, would more than double his/her score on a mathematics achievement test if that student attended a private school instead of a public one. The private school advantage is slightly more pronounced for those in coeducational institutions. To check the robustness of this result, we calculated the private school effect for a randomly chosen student with the average public school characteristics. The results, shown on the lower panel of table 4, are not substantially different.

IV. THE NATURE OF THE PUBLIC/Private Differential

The previous section showed that private school students in Thailand score higher in mathematics achievement scores at the end of eighth grade than do

Table 4. Private School Effects after Holding Constant for Background Characteristics, Thailand, 1981–82

<table>
<thead>
<tr>
<th>Effect</th>
<th>Predicted scores of student with characteristics of average private school pupil if that student were in</th>
<th>Private</th>
<th>Public</th>
<th>Private/public differential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total unconditional effect</td>
<td>26.22</td>
<td>11.09</td>
<td>15.13</td>
<td></td>
</tr>
<tr>
<td>Effect by student type</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male in single-sex class</td>
<td>24.53</td>
<td>10.45</td>
<td>14.07</td>
<td></td>
</tr>
<tr>
<td>Female in single-sex class</td>
<td>24.99</td>
<td>10.83</td>
<td>14.17</td>
<td></td>
</tr>
<tr>
<td>Female in coed class</td>
<td>28.27</td>
<td>11.36</td>
<td>16.91</td>
<td></td>
</tr>
<tr>
<td>Male in coed class</td>
<td>27.83</td>
<td>11.96</td>
<td>15.86</td>
<td></td>
</tr>
</tbody>
</table>

Predicted scores of student with characteristics of average public school pupil if that student were in

<table>
<thead>
<tr>
<th>Effect</th>
<th>Private</th>
<th>Public</th>
<th>Private/public differential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total unconditional effect</td>
<td>27.15</td>
<td>10.31</td>
<td>16.83</td>
</tr>
<tr>
<td>Effect by student type</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male in single-sex class</td>
<td>24.57</td>
<td>9.39</td>
<td>15.17</td>
</tr>
<tr>
<td>Female in single-sex class</td>
<td>25.03</td>
<td>9.76</td>
<td>15.27</td>
</tr>
<tr>
<td>Female in coed class</td>
<td>28.31</td>
<td>10.30</td>
<td>18.01</td>
</tr>
<tr>
<td>Male in coed class</td>
<td>27.87</td>
<td>10.90</td>
<td>16.97</td>
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</tbody>
</table>

Note: Calculated from tables 1 and 3.
their public school counterparts, after controlling for previous achievement, socioeconomic background, and systematic selection by school type. For policymakers, the remaining question is, what accounts for this achievement differential? Is it possible to identify characteristics of private schools that contribute most to the private school achievement effect? What do administrators and teachers do that is different? What is the influence of a student's peers on relative achievement? Can any lessons regarding the input mix be applied to public schools?

This section attempts to answer some of these questions for Thailand. The method is to redo the estimates of the previous section. This time, however, the full achievement equation (equation 3), including school characteristics, is estimated; that is, both components of \( X \) are included in the equation. We then discuss how the school-specific components in these vectors of explanatory variables affect achievement in the public and private sectors.

**Differences in Peer Group and School Attributes**

Table 5 presents, for private and public schools, the mean values of the school, classroom, teacher, and peer group attributes that are used in the estimation procedure. They indicate some basic differences between private and public schools in teaching methods and administration. Also, private schools appear advantaged in two respects and disadvantaged in a third. On the one hand, private schools are, on average, half the size of public schools—suggesting greater individualization of programs—and they are located in regions with per capita incomes 30 percent higher than those in which public schools are located—suggesting greater access to resources. On the other hand, fewer than 10 percent of the teachers in private schools, compared with 61 percent of the teachers in public schools, are certified to teach mathematics.

Characteristics of teachers and their teaching practices differ between public and private schools. A higher proportion of students in private schools have older, and therefore possibly more experienced teachers. The proportion of students with female teachers is higher in private than in public schools. A higher proportion of students in the private subsample have teachers who have undergone some in-service training. Unfortunately, the data do not contain a great deal of additional information regarding the individual teachers of the sampled students.

There is a fair amount of information regarding teaching practices. Teachers of students in private schools tend to spend more time maintaining order in the classroom and giving tests and quizzes. Students in public schools tend to rely a little less on commercially produced teaching materials such as workbooks. However, the differences for these variables are not substantial.

The mathematics classes included in the sample differ for public and private schools. A higher proportion of private students are in enriched mathematics classes, and the size of mathematics classes is larger in private schools.
Table 5. Characteristics of Private and Public Schools in Thailand, 1981–82

<table>
<thead>
<tr>
<th>Variable description (X_{ij})</th>
<th>Private</th>
<th>Public</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>School-level characteristics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average district per capita income (in baht)</td>
<td>16,589.0</td>
<td>12,602.0</td>
</tr>
<tr>
<td></td>
<td>(4,318.4)</td>
<td>(4,520.0)</td>
</tr>
<tr>
<td>School enrollment</td>
<td>747.8</td>
<td>1,576.6</td>
</tr>
<tr>
<td></td>
<td>(493.9)</td>
<td>(1,073.2)</td>
</tr>
<tr>
<td>Proportion of teachers certified to teach mathematics</td>
<td>0.103</td>
<td>0.607</td>
</tr>
<tr>
<td><strong>Teacher and class characteristics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher's age in years</td>
<td>34.6</td>
<td>29.0</td>
</tr>
<tr>
<td></td>
<td>(11.0)</td>
<td>(6.6)</td>
</tr>
<tr>
<td>Proportion of male teachers</td>
<td>0.261</td>
<td>0.361</td>
</tr>
<tr>
<td>Proportion having in-service training</td>
<td>0.231</td>
<td>0.101</td>
</tr>
<tr>
<td>Proportion teaching enriched mathematics class</td>
<td>0.308</td>
<td>0.200</td>
</tr>
<tr>
<td>Proportion using workbook often</td>
<td>0.263</td>
<td>0.238</td>
</tr>
<tr>
<td>Proportion spending more than 15 minutes a week maintaining order</td>
<td>0.601</td>
<td>0.484</td>
</tr>
<tr>
<td>Minutes a week spent on quizzes and tests</td>
<td>44.348</td>
<td>30.514</td>
</tr>
<tr>
<td></td>
<td>(62.429)</td>
<td>(24.975)</td>
</tr>
<tr>
<td>Number of students in target class</td>
<td>44.1</td>
<td>41.9</td>
</tr>
<tr>
<td></td>
<td>(6.8)</td>
<td>(10.7)</td>
</tr>
<tr>
<td><strong>Peer group characteristics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average of average pretest scores</td>
<td>10.87</td>
<td>8.84</td>
</tr>
<tr>
<td>Average proportion of mothers with more than a primary education</td>
<td>0.24</td>
<td>0.15</td>
</tr>
<tr>
<td>Average proportion of fathers with a professional occupation</td>
<td>0.19</td>
<td>0.15</td>
</tr>
</tbody>
</table>

*Note: Numbers in parentheses are standard deviations.

The rough picture provided by this comparison of means is that teachers in private schools have fewer credentials, on average, than their public school counterparts. However, their students are more heavily exposed to in-class work and exercises. Private school students also have an advantage over public school students in terms of the learning environment provided by peer groups. In the next two subsections, we investigate how these differences in characteristics and teaching practices translate into differences in achievement gain.

**Peer Group Effects**

Because students interact with each other in school, the ability and socioeconomic status of fellow students could affect individual achievement. To account for this possibility, we reran the achievement equations with the addition of three classroom-level variables: average pretest score, proportion of mothers with greater than a primary-school education, and proportion of fathers with professional occupations. The results of this regression, displayed in the first four columns of table 6, show that average schoolmate pretest score is highly
Table 6. Achievement Functions for Private and Public Schools in Thailand, 1981–82

<table>
<thead>
<tr>
<th>Variable</th>
<th>Regression including peer group characteristics</th>
<th>Regression including school characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Private</td>
<td>Public</td>
</tr>
<tr>
<td>Constant</td>
<td>-18.06</td>
<td>-0.322</td>
</tr>
<tr>
<td>Past achievement</td>
<td>0.574</td>
<td>13.320</td>
</tr>
<tr>
<td>Time-invariant background (Z, )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Father's occupation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skilled</td>
<td>0.762</td>
<td>0.676</td>
</tr>
<tr>
<td>Clerical</td>
<td>-1.003</td>
<td>-0.996</td>
</tr>
<tr>
<td>Professional</td>
<td>0.309</td>
<td>0.285</td>
</tr>
<tr>
<td>Mother's education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>0.001</td>
<td>0.001</td>
</tr>
<tr>
<td>Secondary</td>
<td>-1.681</td>
<td>-1.637</td>
</tr>
<tr>
<td>University</td>
<td>-1.220</td>
<td>-0.933</td>
</tr>
<tr>
<td>Educational expectations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5–8 more years</td>
<td>0.834</td>
<td>1.216</td>
</tr>
<tr>
<td>&gt; 8 more years</td>
<td>0.802</td>
<td>1.024</td>
</tr>
<tr>
<td>Age</td>
<td>0.406</td>
<td>0.600</td>
</tr>
<tr>
<td>Age squared</td>
<td>-0.001</td>
<td>-0.726</td>
</tr>
<tr>
<td>Eldest child</td>
<td>-0.076</td>
<td>-0.104</td>
</tr>
<tr>
<td>Language of instruction also used at home</td>
<td>-1.751</td>
<td>-1.777</td>
</tr>
<tr>
<td>Male in single-sex class</td>
<td>-1.883</td>
<td>-2.026</td>
</tr>
<tr>
<td>Female in single-sex class</td>
<td>-2.003</td>
<td>-1.489</td>
</tr>
<tr>
<td>Female in coed class</td>
<td>-1.075</td>
<td>-1.167</td>
</tr>
<tr>
<td>Background during eighth grade (X_{8th})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tutoring</td>
<td>-0.115</td>
<td>-1.086</td>
</tr>
<tr>
<td>Parental encouragement</td>
<td>0.359</td>
<td>1.129</td>
</tr>
<tr>
<td>Home calculator</td>
<td>0.158</td>
<td>0.260</td>
</tr>
<tr>
<td>Peer group during eighth grade (X_{8th})</td>
<td>0.441</td>
<td>5.748</td>
</tr>
</tbody>
</table>

(Table continues on the following page.)
### Table 6 (continued)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Private</th>
<th>Public</th>
<th>Private</th>
<th>Public</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportion of mothers with more than primary education</td>
<td>2.406</td>
<td>0.842</td>
<td>-1.236</td>
<td>-0.717</td>
</tr>
<tr>
<td>Proportion of fathers with professional occupation</td>
<td>-4.000</td>
<td>-1.115</td>
<td>0.143</td>
<td>0.098</td>
</tr>
<tr>
<td>Grade 8 school characteristics ($X_{iss}$)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>District-level per capita income</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>School enrollment</td>
<td>-0.008</td>
<td>-4.136</td>
<td>0.000</td>
<td>0.126</td>
</tr>
<tr>
<td>Teacher's math qualifications</td>
<td>7.460</td>
<td>0.971</td>
<td>0.481</td>
<td>1.061</td>
</tr>
<tr>
<td>Class size</td>
<td>0.324</td>
<td>1.034</td>
<td>-0.001</td>
<td>-0.077</td>
</tr>
<tr>
<td>Teacher's age</td>
<td>-0.006</td>
<td>-0.130</td>
<td>-0.010</td>
<td>-0.463</td>
</tr>
<tr>
<td>Male teacher</td>
<td>-3.154</td>
<td>-1.732</td>
<td>-0.341</td>
<td>-1.203</td>
</tr>
<tr>
<td>Teacher in-service training</td>
<td>-3.025</td>
<td>-0.578</td>
<td>0.148</td>
<td>0.335</td>
</tr>
<tr>
<td>Enriched math class</td>
<td>2.646</td>
<td>0.536</td>
<td>0.924</td>
<td>2.746</td>
</tr>
<tr>
<td>Workbook used often</td>
<td>-3.171</td>
<td>-0.937</td>
<td>-0.143</td>
<td>-0.466</td>
</tr>
<tr>
<td>Maintaining order</td>
<td>4.032</td>
<td>2.898</td>
<td>-1.438</td>
<td>-5.318</td>
</tr>
<tr>
<td>Minutes test taking</td>
<td>-0.010</td>
<td>-0.680</td>
<td>-0.008</td>
<td>-1.421</td>
</tr>
<tr>
<td>Lambda</td>
<td>-3.960</td>
<td>-1.578</td>
<td>-1.966</td>
<td>-0.895</td>
</tr>
</tbody>
</table>

Regression including peer group characteristics

Regression including school characteristics
correlated with the individual's posttest score, but that the social class background of peers is unrelated to achievement.

In order to determine the extent to which peer groups affect the private/public differential, we computed the unconditional private school effect for a randomly chosen student with the average background and the average peer group characteristics of private school students. A comparison of the first panel of table 7 with that of table 4 reveals that private/public differentials decline to about 5 points after peer group characteristics are taken into account. This result is robust with respect to a public or private reference group. We conclude that peer groups can account for a substantial part (but not all) of the difference between public and private school achievement.

**School Practices and Achievement Gain**

The reestimation of the student achievement functions includes the additional variables listed in table 5. As before, private and public school functions are estimated separately. Aside from statistical reasons for not assuming homogeneity of slope and intercept coefficients, separate estimations reflect the fact

<table>
<thead>
<tr>
<th>Table 7. Private School Effects After Holding Constant for Peer Group and School Characteristics, Thailand, 1981–82</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predicted scores of student with average background and peer group characteristics of private school student if that student were in</td>
</tr>
<tr>
<td>Effect</td>
</tr>
<tr>
<td>--------</td>
</tr>
<tr>
<td>Total unconditional effect</td>
</tr>
<tr>
<td>Effect by student type</td>
</tr>
<tr>
<td>Male in single-sex class</td>
</tr>
<tr>
<td>Female in single-sex class</td>
</tr>
<tr>
<td>Female in coed class</td>
</tr>
<tr>
<td>Male in coed class</td>
</tr>
</tbody>
</table>

<p>| Predicted scores of student with average background of private school student and private school characteristics if that student were in |</p>
<table>
<thead>
<tr>
<th>Effect</th>
<th>Private</th>
<th>Public</th>
<th>Private/Public differential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total unconditional effect</td>
<td>12.89</td>
<td>12.42</td>
<td>0.47</td>
</tr>
<tr>
<td>Effect by student type</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male in single-sex class</td>
<td>12.43</td>
<td>11.99</td>
<td>0.44</td>
</tr>
<tr>
<td>Female in single-sex class</td>
<td>15.65</td>
<td>12.57</td>
<td>3.08</td>
</tr>
<tr>
<td>Female in coed class</td>
<td>10.57</td>
<td>12.18</td>
<td>-1.61</td>
</tr>
<tr>
<td>Male in coed class</td>
<td>12.27</td>
<td>13.03</td>
<td>-0.76</td>
</tr>
</tbody>
</table>

*Note: Calculated from tables 5 and 6.*
that unmeasured management practices and “school culture” could differ between public and private schools. Teachers and administrators in public and private schools probably face entirely different sets of incentives. Thus, we expect the coefficients of each of the school- or teacher-related variables to differ for public and private school students.

The coefficients are presented in table 6; they demonstrate considerable differences in effects for public and private students. After holding individual student characteristics constant, district-level per capita income is positively correlated with achievement in public schools only. This may be due to local contributions to school maintenance, or the variable may capture the effect of the availability of ancillary public services that may influence achievement, such as electricity or running water. In any case, public school students who go to school in richer communities do better; community wealth has no effect on private school student achievement.

Students in small private schools do better than those in large ones, but school size has no effect on achievement of public school students. Not surprisingly, the effect of class size is insignificant, because the average class size (over 40 students) for both public and private schools is well outside the range of class sizes which are positively associated with increased student achievement (Glass, McGaw, and Smith 1981). Also, teaching staff qualifications are not significantly related to achievement in either sector.

Private school students with female teachers outperform those with male teachers; this may reflect a disproportionate utilization of male teachers in the low-performing all-male private schools. Students in enriched mathematics classes outperform students in regular or remedial classes, but the effects are significant for public school students only. Finally, more teacher time devoted to maintaining order is positively related to achievement in private schools but negatively related in public schools, possibly because public school classes in which teachers have to spend a large amount of time maintaining order are “problem” classes. In-service teacher training is unrelated to student achievement.

Is there still a private school effect even after differences in teaching practices and school characteristics are held constant? The answer is yes, according to the second panel of table 7, which measures achievement gain by the same method as applied in the previous section. Although the achievement advantage of private schools is lessened with the addition of these variables, there is still a residual effect of a half point, on average. This effect is substantial (over 3 points) for students in female single-sex schools, who benefit most from private schooling. This remaining private/public school differential indicates that there are unmeasured differences (such as in employee incentives) between private and public schools that influence achievement. These findings need to be qualified, however, because the calculation is sensitive to the choice of the public or private reference point.
V. UNIT COSTS OF PUBLIC AND PRIVATE SCHOOLS

The previous sections show that private schools are more effective than public schools, even after holding constant for characteristics of students as well as their peers. The bulk of the effect is attributable to measured differences in input mixes (including teaching practices). A critical question is whether more effective schools are also necessarily costlier. Cost data imply that the answer is an emphatic no.

It was not possible to obtain actual expenditure data for the schools in the IEA SIMS sample. We did, however, obtain data on school-level income. Under the assumption that schools spend all of their income, income data can be used to estimate total costs per school. Data on the following categories of income were provided for the same academic year in which the tests were administered: support from the government, fees, material donations, cash donations, and student scholarships. From the school-level data, we computed unit costs (see table 8), which were substantially lower for private schools (1,762 baht) than for public schools (4,492 baht). This result holds for single-sex and coeducational institutions. We conclude that private schools are more cost-effective than public schools.

The cost estimates are obviously rough. On the one hand, some schools (particularly private ones) might save a portion of their budget. If so, costs would be overestimated and this would strengthen our conclusion about the cost-effectiveness of private schools. On the other hand, private Catholic schools' budgets may not reflect their actual costs; for example, Catholic schools often rely heavily on teaching clergy, whose salaries substantially understate

<table>
<thead>
<tr>
<th>School type</th>
<th>Private</th>
<th>Public</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>1,762.03</td>
<td>4,491.90</td>
</tr>
<tr>
<td></td>
<td>(289.17)</td>
<td>(6,470.22)</td>
</tr>
<tr>
<td>Single-sex grade 8, male</td>
<td>1,780.68</td>
<td>3,992.59</td>
</tr>
<tr>
<td></td>
<td>(77.26)</td>
<td>(1,387.31)</td>
</tr>
<tr>
<td>Single-sex grade 8, female</td>
<td>2,159.70</td>
<td>3,988.67</td>
</tr>
<tr>
<td></td>
<td>(138.32)</td>
<td>(764.20)</td>
</tr>
<tr>
<td>Coed grade 8</td>
<td>1,615.76</td>
<td>4,646.92</td>
</tr>
<tr>
<td></td>
<td>(229.95)</td>
<td>(7,109.48)</td>
</tr>
<tr>
<td>Single-sex class, male</td>
<td>1,634.66</td>
<td>3,379.48</td>
</tr>
<tr>
<td></td>
<td>(176.97)</td>
<td>(1,1476.21)</td>
</tr>
<tr>
<td>Single-sex class, female</td>
<td>2,171.66</td>
<td>3,992.80</td>
</tr>
<tr>
<td></td>
<td>(115.45)</td>
<td>(1,113.66)</td>
</tr>
<tr>
<td>Coed class</td>
<td>1,567.56</td>
<td>4,856.70</td>
</tr>
<tr>
<td></td>
<td>(111.39)</td>
<td>(7,557.12)</td>
</tr>
</tbody>
</table>

Note: Numbers in parentheses are standard deviations.
their market value, and facilities may be subsidized by the church (Levin 1987). If so, private school costs would be underestimated. Moreover, it was not possible to ascertain whether some of the income categories were for earmarked one-time expenditures (such as contributions to a building fund). If there are systematic differences in categorization for public and private schools, the cost estimates could change—but probably not enough to overturn the relative cost-effectiveness of the results.

VI. Conclusions

This article provides evidence for Thailand regarding the relative effects of private and public schools in enhancing eighth grade mathematics achievement. An important issue in such comparisons is how to control for the effect of selection into public or private schools, as well as the direct effect of background on achievement. This article uses pre–eighth grade and post–eighth grade test scores to estimate value added equations for private and public schools, as well as statistical corrections for selection. Although selection biases are mitigated in value added formulations of achievement functions (as opposed to level-of-achievement formulations), they are still significant in Thailand. For the sample in this analysis, there appears to be positive selection into public schools and negative selection into private schools—that is, individuals who are more likely to score higher, due to background and student characteristics, go into public schools rather than private schools. The analysis indicates that it is important to test the robustness of simple comparisons of public/private differentials before making policy recommendations.

A principal conclusion is that students in private schools perform significantly better than their public school counterparts, after holding constant for selection and background factors. Thus, private schools are more “effective” in enhancing achievement. The natural next question is at what cost? Unit costs in private schools are, on average, much lower than unit costs in public schools. Combined with the finding regarding the positive private school achievement effect, this implies that private schools are also relatively more cost-effective (that is, efficient) than public schools.

The assumptions need to be tested with other data, and the results need to be replicated in other settings before they are used to make general policy recommendations. The estimated differentials, although generally large, do vary. Nevertheless, this study shows what is possible in Thailand. When budgetary constraints limit the public sector’s ability to provide enough places for everybody at some levels of schooling, private schools can be considered as a cost-effective option to respond to growing demand, at least for those who can afford them. Subsidized public places could then be improved and directed to the needy.

Cost-effective private schools can also be analyzed to see if any lessons can be transferred to public schools to improve their performance. In this study,
private schools tended to thrive even though they were relatively less endowed with measurable inputs, such as the proportion of faculty certified to teach mathematics. Classroom practices (time spent maintaining order and doing classroom exercises) appeared to be important explanations for the private school advantage.

It may not be possible to capture the whole private school advantage simply by mimicking the measurable characteristics of private schools. Even after measured inputs are held constant, a small private school advantage persists, particularly for females in single-sex schools. This indicates that there are unmeasured but nonetheless important managerial incentives and practices in the (female single-sex) private system that result in enhanced achievement. More work is needed to identify these sources of gains in efficiency.

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World Bank. 1986. *Financing Education in Developing Countries: An Exploration of Policy Options.* Washington, D.C.
Terms of Trade, Tariffs, and Labor Market Adjustment in Developing Countries

Sebastian Edwards

A three-goods model (importables, exportables, and nontradables) is used to analyze labor market adjustment to changes in the terms of trade and import tariffs for a small, open economy. First, a three-goods, four-factor model (labor, and capital specific to each sector) is developed and used to investigate how an exogenously generated change in a country's terms of trade affects labor allocation and wages in the short run. Next, a more traditional three-goods, two-factor model is used to examine the effects in the long run. The analysis is carried out under alternative assumptions regarding wage flexibility: full flexibility, economy-wide real wage rigidity, and sector-specific real wage rigidity.

This article presents a theoretical analysis of the interaction between a developing country's external sector and its labor market. In particular, the article investigates how disturbances in the terms of trade and changes in import tariffs (that is, trade liberalization reforms) affect labor allocation, unemployment, and wages.

Historically, developing countries have faced an uncertain external environment characterized, among other things, by wide swings in the terms of trade. These changing external relative prices not only have an impact on the level of real income but also tend to affect the productive structure by provoking changes in relative sectoral profitabilities and resource allocations. The implications of adverse terms of trade shocks on employment and wages have been a recurrent concern of policymakers in developing countries. It has frequently been argued that because of the potentially harmful employment effects of changes in terms of trade, countries should adopt policies that reduce their openness and thus their vulnerability to externally generated economic disturbances. The possible unemployment effects of tariff liberalization reforms have

The author is associate professor of economics at the University of California, Los Angeles, and is a research associate with the National Bureau of Economic Research. This is a substantially revised and shortened version of a paper presented at the World Bank's Conference on the Adjustment of Labor Markets in LDCs to External Shocks, Washington, D.C., June 26–27, 1986. The author is indebted to Alejandra Cox Edwards, Ruth Klinov, Assar Lindbeck, Al Harberger, and three anonymous referees for helpful comments. Financial support from the National Science Foundation is gratefully acknowledged.

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also been a concern of policymakers. Thus, some politicians have resisted the advice of multilateral agencies regarding trade reform, fearing that the lowering of tariffs will generate political costs in the form of (short-run) unemployment.

Despite the importance for policy formation of an understanding of the interactions between terms of trade disturbances, import tariffs, and the labor market, there has been little analysis of these issues. The National Bureau of Economic Research (NBER) multicountry study on trade regimes and employment (Krueger 1983) provides ample evidence that countries which have followed outward-oriented policies generally have a better employment record—greater employment creation and lower unemployment rates over the long run—than nations that have adopted import-substitution industrialization strategies. But this study emphasized the long-run characteristics and performance of labor markets, saying little about aggregate employment effects during the transition immediately following tariff reform.

The limited evidence on the short-run aggregate employment consequences of trade liberalization indicates that mild trade reforms have not led to significant aggregate unemployment. This seems to be one of the preliminary conclusions of the exhaustive World Bank cross-country study of trade liberalization (Michaely, Choksi, and Papageorgiou 1986); however, the evidence from this massive investigation is somewhat difficult to interpret. The episodes analyzed were frequently exceedingly mild cases of liberalization—for example, the 1970 Turkish devaluation, which would barely qualify as even a very timid liberalization. Also, it is not possible to know precisely from these studies whether specific changes in aggregate employment resulted from the trade reform or from the effects of other policies. This is the case, for example, for the slight increases in aggregate unemployment observed after the trade reforms in Turkey in 1980, in the Republic of Korea during 1979–80, in the Philippines in 1981, and in Israel during 1972–77.

This article attempts to fill a gap in the literature by presenting a theoretical analysis of how changes in the external sector affect a developing country's labor market in both the short and long runs and in the transition period between them. The analysis is conducted largely from the point of view of international trade theory. It also points out some of the weaknesses of this theory, suggesting ways in which it could be strengthened.

Section I uses a three-sector (exportables, importables, and nontradables), four-factor (labor, and capital specific to each sector) trade model to analyze labor market adjustments to changes in the relative prices of commodities resulting from terms of trade disturbances or tariff changes. The analysis also considers the long-run case in which capital is allowed to adjust across sectors. Section II applies the model to an analysis of how economy-wide and sector-specific wage rigidities affect labor market adjustment to exogenous shocks. In the tradition of international trade literature, the model used in sections I and II considers only final goods. Section III presents the conclusions.
I. TERMS OF TRADE, TARIFFS, AND LABOR MARKET ADJUSTMENT IN AN OPEN ECONOMY

This section deals with the simple analytics of the interaction between the relative prices of commodities and labor market adjustment in a small open economy. The analysis uses a fairly standard international trade model with three final goods (importables, exportables, and nontradables) and examines both the long- and short-run labor market reactions to a terms of trade shock. The discussion in this section assumes full flexibility of wages (the case with a minimum wage is examined in section II). It is assumed that in the short run capital is sector specific, whereas labor can move freely across sectors; in the medium and long runs, however, both capital and labor can move across sectors. Consequently, for the short run, the model is a three-goods, four-factor model, and for the longer run it is a three-goods, two-factor model. To simplify the discussion, most of the analysis follows the international trade tradition and ignores issues related to capital accumulation. The discussion also ignores the existence of imported intermediate inputs.

The Economy under Consideration

Assume the case of a small country that produces three goods: exportables (X), importables (M), and nontradables (N). Production is carried out using capital and labor. Production functions have the conventional properties, in the short run capital is assumed to be sector-specific and labor is assumed to be perfectly mobile among the three sectors. Following the traditional international trade literature, it is assumed that available quantities of each factor are given and that their supplies are completely inelastic (see, for example, Jones 1971; Mayer 1974; Mussa 1974, 1978, 1982; Neary 1978a, 1978b, 1982; and S. Edwards 1986c).

Imports are initially subject to a tariff, and external borrowing is not allowed. (This assumption may be easily relaxed. See S. Edwards and van Wijnbergen forthcoming.) The labor market is initially assumed to be free of distortion. (Section II examines the consequences of assuming the existence of a minimum wage, which is binding in the short run.) It is also initially assumed that the domestic capital market is free of distortion, with the real rates of return on capital being equalized across sectors in the long run. The tariff proceeds are returned to consumers via lump sum transfers. Factor intensity assumptions are that importables have the highest capital-labor ratio, nontradables have the next highest ratio, and exportables are labor intensive. This latter assumption is probably the most appropriate for the case of developing

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1. Some authors have assumed that labor rather than capital is sector specific in the short run. Alternatively, one can assume that both labor and capital are fixed to their sector of origin in the short run. Under these assumptions, some of the results would differ from those presented here.
countries; moreover, it ensures that the system is stable under sector-specific wage rigidity (Neary 1982).

In this model, the labor market effects of a terms of trade shock are (almost) equivalent to those of an import tariff change that results in a change of the same magnitude in the domestic price of imports. The only difference between these two disturbances is that, for the same relative price effect, the terms of trade disturbance will generate a larger income effect. With this caveat in mind, the results that follow can be interpreted to refer either to a terms of trade shock or to a change in import tariffs. To simplify the exposition, the discussion is actually carried out for the terms of trade disturbance.

Terms of Trade Shocks, Relative Prices, and Structural Adjustment

This subsection investigates the effects of a reduction in the world price of the country's importables. For analytical convenience, it is assumed that initially there are no quantitative import restrictions and that the nominal exchange rate is fixed and equal to one. As noted, while capital is assumed to be sector specific in the short run, it can move freely between sectors in the long run. The discussion deals first with long-run effects, then with the short-run effects, and finally with the transition to the long run. The analysis concentrates on the behavior of goods prices, employment allocation across sectors, wage behavior, and production. In the tradition of standard international trade models, it is initially assumed that there is no unemployment. This assumption is later relaxed.

Long-run effects. In this class of models (a small open economy with three goods) and with the usual competition assumptions in the medium and long runs, when all factors can move freely across sectors, domestic prices of the three final goods are fully determined (under nonspecialization) by world prices, technology, and tariffs. Equilibrium can be described in the following way: with no specialization in production, world prices of exportables and importables (plus the tariff) determine the rewards to both factors of production; these rewards, under the assumption of competition, determine the price of nontradables. Demand considerations for nontradables determine total output of nontradables and total factors used in their production. The remaining factors are used in the production of exportables and importables in a traditional Heckscher-Ohlin (H-O) fashion. In this analysis, the price of exportables is the numeraire (that is, $P_X = 1$).

The effect on factor rewards and the relative price of nontradables of an exogenous shock that reduces the international price of importables can be analyzed using figure 1, which is the dual to the well-known Lerner-Pearce diagram. The initial equilibrium is given by the intersection of the three

2. This diagram and the discussion that follows assume that both before and after the relative price change there is no specialization (that is, the three goods are produced). This is a reasonable assumption.
Figure 1. Effect on Factor Rewards of a Reduction in the World Price of Importables

In the context of our discussion, where the exogenous shock is a change in the price of exportables relative to importables. It should be noted that in other three-goods, two-factor models, it is not so easy to rule out specialization. This is the case, for example, if importables and exportables are collapsed into a single good (tradables). This, of course, is only possible if the relative price of exportables importables does not change. Komiya (1967) pioneered the three-goods, two-factor model.
Figure 2. Long-Run Adjustments in Production and Factor Allocation Resulting from a Reduction in the World Price of Importables

The production side of the model, as well as factor adjustments, can be analyzed using a three-goods Edgeworth-Bowley box as developed by Melvin (1968) and used by Corden and Neary (1982) and S. Edwards (1986b). Figure 2 illustrates the case considered here, in which exportables are the most labor-intensive good. In this diagram, isoquants for nontradables are drawn from origin $O_N$. At the initial prices, the nontradable goods market clears at a level of production given by isoquant $NN_0$. The capital-labor ratio in nontradables production is given by the slope of $O_NO_M$. Production of exportables is measured from $O_M$ and that of importables by the distance $O_MR$. In equilibrium, the slope of isoquant $NN_0$ at $O_M$ equals the slopes of the corresponding isoquants for exportables and importables (not drawn), which are tangent at $R$.

Because the reduction in the price of importables generates an increase in the wage rate relative to the rental rate, all three sectors now become more capital intensive. This is shown in figure 2, where the dashed rays depict the new capital-labor ratios after adjustment to the reduction in the world price of importables.

3. Alternatively, a standard supply and demand diagram for nontradables could be used to analyze how the price of nontradables reacts to the terms of trade shock.
importables. But to determine the new equilibrium, it is necessary to know what will happen to the demand for nontradables as a consequence of the reduction in the world price of importables.

Where will the new equilibrium point be for the production of nontradables? If total output of nontradables remained constant, the new equilibrium would be on the \( NN_0 \) isoquant at point \( O'_M \). Production of importables would be reduced to \( O'_N T \), and production of exportables would increase to \( O_X T \). This result is obtained under the assumption that demand for nontradables is not affected by the reduction in the world (and domestic) price of importables. In general, however, this will not be the case. Moreover, given the assumptions regarding capital-labor intensity, it is expected that demand for nontradables will increase as a result of improvement in the terms of trade. There are two reasons for this: (1) after the exogenous shock the (relative) price of nontradables will decline (see figure 1), producing a substitution effect in demand toward nontradables; and (2) the improvement in the terms of trade will generate a positive income effect, as national income at international prices increases, which will also have a positive effect on demand for nontradables. With a higher demand for nontradables, long-run equilibrium in figure 2 will be on the new capital-labor ratio ray to the left of the \( NN_0 \) isoquant on a point such as \( O''_M \), with production of exportables being equal to \( O_X S \), production of importables having been reduced to \( O''_N S \), and production of nontradables being equal to \( O''_N O'M \).

In summary, under the assumptions on capital intensity, the effects of an improvement in the terms of trade, when all factors can move freely across sectors, will be as follows: (1) prices of nontradables relative to exportables will fall; (2) wages relative to all goods will increase; (3) the real rate of return on capital relative to all goods will decrease; (4) production of exportables and nontradables will increase; and (5) production of importables will decline.

These equilibrium price movements give us information on potential adjustment problems emerging from shocks stemming from abroad. If, for example, under fixed exchange rates nominal prices on nontradables are downwardly rigid, there may be a problem. In the small country case, the world price of exportables is given, so the nominal price of nontradables would have to decline to attain equilibrium; under nominal price rigidity, this will not happen and unemployment will result. Notice, however, that if real wages are downwardly rigid, no disequilibrium will emerge in the long run because real wages will increase in terms of all goods. This is not the case in the short run, however, as will be shown below.

It is important to recall that the discussion presented here can also be applied to the case of a trade liberalization reform aimed at reducing taxes on imports. As noted above, the magnitude of the income effect is the main difference between the case of a policy-induced reduction in the price of importables (via a lower import tariff) and an exogeneously generated reduction (via a lower
world price of importables). For the same change in the domestic price of importables, the exogenous shock generates a higher income effect (see S. Edwards and van Wijnbergen forthcoming).

**Short-run effects.** Given the assumption that in the short run capital is sector specific while labor can move freely across sectors, the model discussed here can be considered to have three final goods and four factors (labor, capital in $X$, capital in $M$, and capital in $N$).\(^4\)

The initial labor market equilibrium is illustrated in figure 3, in which the horizontal axis measures total labor available in the economy and the vertical axis depicts the wage rate in terms of exportables. Demand for labor by the tradable goods sector, $L_T$, is equal to the horizontal sum of the demand for labor by the exportables sector, $L_X$, and demand for labor by the importables sector. Demand for labor by the nontradable goods sector is shown by $L_N$. The initial equilibrium is characterized by a wage rate equal to $w_0$, with $O_L L_A$ labor used in the production of exportables, $L_D L_B$ labor used in the production of importables, and $O_N L_B$ labor used in the production of nontradables.

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There are several differences between this short-run model and the long-run model discussed in the previous subsection. Because capital is sector specific in the short run, the direct link between the prices of tradable goods and factor rewards is broken. The Stolper-Samuelson theorem does not hold, and the price of nontradables will be determined by the intersection of its demand and supply schedules.

In the short run, under the assumption of sector-specific capital, the reduction in the price of importables will generate changes in the domestic prices of both importables and nontradables (see, for example, Dornbusch 1974, 1980; S. Edwards 1986c). Whereas the domestic price of importables will unambiguously fall, the behavior of the price of nontradables will depend on the assumptions regarding substitutability and the magnitude of the income effect. Assuming that the three goods are gross substitutes in consumption and production and that the income effect does not exceed the substitution effect, it can be shown that as a result of the terms of trade improvement the price of nontradables will fall relative to that of exportables and increase relative to that of importables (S. Edwards 1986c).

The labor market adjustment process is illustrated in figure 4. The reduction in the world price of importables will result in a lower domestic price of

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**Figure 4. Short-Run Labor Market Adjustment to a Reduction in the World Price of Importables**
importables, generating a downward shift of the $L_T$ curve (with the $L_X$ curve constant). The new $L'_T$ curve will intersect the $L_N$ curve at $R$. This is not a final equilibrium situation, however, because the reduction in the world price of importables will also result in a decline in the price of nontradables (relative to exports). As a consequence, $L_N$ will shift downward (by less than the shift in $L'_T$), and final short-run equilibrium will be achieved at $S$. In this new equilibrium, production of exportables has increased—with labor used by this sector increasing by $L_{ALQ}$. The production of nontradables may either increase or decrease, and production of importables will fall. In the case depicted in figure 4, labor has moved out of the importables sector and into the exportables and nontradables sectors.

What has happened to factor rewards in the short run? Wages have declined in terms of exportables (from $w_0$ to $w_1$ in figure 4). Wages have also declined in terms of nontradables because the vertical distance between the $L_N$ and $L'_N$ curves is smaller than the reduction in $w$ from $w_0$ to $w_1$. Wages, however, have increased relative to importables because the domestic price of importables has fallen by more than the fall in wages. In the exportables sector, the real return to capital has increased; the real returns to capital in the importables and nontradables sectors could have either increased or decreased.5

Figure 5 summarizes the adjustment in production of the three goods when capital is sector specific. The initial (pre-shock) equilibrium is given by points $A$ and $G$, with production of exportables proportional to the distance $O_A A$, production of nontradables given by isoquant $NN_o$, and production of importables proportional to the distance $GA$.

5. Formally, the real return on capital specific to the importables sector will decrease in terms of importables and could either increase or decrease in terms of the other two goods.
Initially, the nontradable goods sector uses $O_N K_N$ capital, the exportables sector uses $O_x K_x$ capital, and the importables sector uses the rest ($K_N K_x$). Because capital is sector specific in the short run, these amounts of capital will also be used by each sector after the terms of trade disturbance. This means that the new short-run equilibrium points will necessarily lie on the $K_N K_N$ and $K_x K_x$ lines. The reduction in the world price of importables will result in an increase in the use of labor (and thus in production, for given amounts of capital) in the exportables and nontradables sectors. This is shown in figure 5 by the movement of the equilibrium points to $B$ and $F$. The dashed lines representing the new capital-labor ratios show that both the exportables and nontradables sectors have become relatively more labor intensive, whereas the importables sector has become more capital intensive. A comparison of figures 5 and 2 provides some indication of how the transition period after the terms of trade shock will look, with factors moving from their short-run allocation toward their long-run allocation.

In summary, for the general case with wage flexibility, the short-run effects on production, prices, and factor rewards of an improvement in the terms of trade will be as follows: (1) production of exportables will increase; (2) production of importables will decrease; (3) production of nontradables may increase or decrease; (4) wages will increase in terms of importables and decrease in terms of exportables and nontradables; (5) the real return to capital in the exportables sector will increase relative to all goods; (6) the real return to capital in the importables sector will decrease relative to importables but could increase or decrease relative to the other goods; and (7) the real return to capital in the nontradables sector will increase relative to nontradable goods but could either increase or decrease relative to the other two goods.

**Effects during the transition period.** The model used in this section assumes that the main difference between short- and long-run effects of a trade liberalization is that in the short-run capital is locked into its sector of origin. As time passes, however, capital will (slowly) move between sectors. To simplify the exposition, we assume that the movement of capital does not require the use of resources. However, the analysis could be modified by introducing a “moving industry,” which uses labor and a specific factor, as in Mussa (1978).

The transition period will be characterized by factors (both capital and labor) moving between sectors, until the new long-run equilibrium (that is, post-terms of trade shock) capital-labor ratios and production levels are attained. As discussed in the subsection on long-run effects and shown in figure 2, in the final long-run equilibrium all sectors will be more capital intensive, with the exportables sector using more capital than before the shock and the importables sector using less capital than before the shock. As may also be seen from figure 2, the nontradables sector could use either a larger or smaller absolute amount of labor than before the reduction in the world price of importables.

The nature of factor movements during the transition period can be seen in
Figure 6, which combines figures 2 and 5. (To avoid cluttering the diagram, capital-labor ratios have been drawn only for the post-terms of trade shock situation.) The arrows between points B and C and between F and H show the way resources will move during the transition. As may be seen in figure 6, the transition for the case considered here will be characterized by the following: (1) capital and labor will move out of the importable goods sector; (2) capital and labor will move into the exportable goods sector; (3) capital will move into the nontradable goods sector; and (4) labor will move out of the nontradable goods sector.

Table 1 summarizes the short-run, transition-period, and long-run movements of factors and changes in factor prices that follow an exogenously generated improvement in the terms of trade. The rows which show factor movements reveal potential sources of labor market disequilibria and adjustment costs following an exogenous shock stemming from the external sector. Equilibrium will require that labor move into the nontradables sector in the short run and out of it in the longer run. If, however, there are rigidities in the labor market, the adjustment costs of this movement of labor in and then out of the nontradables sector may be high.

This analysis also raises the question, largely ignored until now, of the role of expectations in labor market adjustment following a shock to the external sector. If the terms of trade shock is perceived as temporary, the short-run case will be more relevant. The role of expectations is even more important in the case of a trade liberalization reform that lowers tariffs. If the belief is widespread that the new tariff structure will not be maintained and that tariffs will be raised again, no one will be willing to incur the costs associated with the reallocation of capital.

Figure 6. Adjustments in Production and Factor Allocation during the Transition Period after a Reduction in the World Price of Importables
Table 1. Short- and Long-Run Factor Movements and Changes in Factor Rewards Following a Positive Terms of Trade Shock

<table>
<thead>
<tr>
<th>Sector</th>
<th>Short-run versus initial situation</th>
<th>Long-run versus initial situation</th>
<th>Long-run versus short-run (transition)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor movements</td>
<td>K</td>
<td>L</td>
<td>K</td>
</tr>
<tr>
<td>Exportables</td>
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<td>↑</td>
<td>↑</td>
</tr>
<tr>
<td>Importables</td>
<td>—</td>
<td>↓</td>
<td>↓</td>
</tr>
<tr>
<td>Nontradables</td>
<td>—</td>
<td>↑</td>
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</tr>
</tbody>
</table>

Changes in factor rewards

<table>
<thead>
<tr>
<th></th>
<th>r^a</th>
<th>w</th>
<th>r^b</th>
<th>w</th>
<th>r^b</th>
<th>w</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exportables</td>
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<tr>
<td>Importables</td>
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<tr>
<td>Nontradables</td>
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<td></td>
</tr>
</tbody>
</table>

a. Because capital is sector specific in the short run, the real return to capital can move in different directions in the different sectors. (The arrows in these rows refer to the real return to capital in terms of that sector's price; see text.)

b. In the medium and long runs, capital can move across sectors.

II. TERMS OF TRADE SHOCKS IN THE PRESENCE OF LABOR MARKET RIGIDITIES

The discussion up to this point has followed the more traditional models of international trade, which assume that all factor prices, including wages, are perfectly flexible. That, of course, is a simplifying assumption that does not correspond to reality in many developing countries. Most developing countries have minimum wage laws or other types of rigidities that affect the whole economy or some parts of it. In the past ten years or so, a number of trade models have been developed that assume some type of factor price rigidity (see Brecher 1974; Bruce and Purvis 1984). These models have been useful and have added considerable realism to the analysis, but most of them have concentrated on the case of two goods only. This section extends the three-goods model used in the previous section and discusses the effects of a terms of trade shock under both economy-wide and sector-specific wage rigidities stemming from exogenously imposed minimum wages. The analysis concentrates mainly on the short-run case in which capital is locked into its sector of origin. Although the discussion emphasizes the case of minimum wages, other mechanisms widely applied in developing countries, especially wage indexation, also lead to wage rigidity.

Economy-wide Wage Rigidities

Consider first the case of an economy-wide minimum wage. In order to facilitate the diagramatical exposition, this minimum wage is assumed to be

6. In the long run, as shown above, a terms of trade improvement generates an equilibrium increase in real wages, so a minimum wage in real terms will become less binding.
expressed in terms of exportables. This, naturally, is a simplifying assumption, because in the real world minimum wages are set with respect to a price index. The key consideration is the weight of different prices in the index; if exportables have a "large enough" weight in the index, all the results presented here will follow (see footnote 8). It is also assumed that the initial level of the minimum wage corresponds to the wage that initially generates full employment. This means that before the terms of trade shock, there is no unemployment. Although this simplifying assumption greatly facilitates the exposition, it does not affect the findings significantly.

It is easy to see from figure 4 that if wages, expressed in terms of exportables, are downwardly rigid and capital is sector specific, unemployment will result as a consequence of the shock that reduces the relative price of importables. The magnitude of this unemployment will be equal to the distance FG. This is basically a short-run adjustment cost, which will tend to disappear as capital moves between sectors in the medium and long runs. In general, in the presence of wage rigidity and sector-specific capital, a short-run disequilibrium will emerge as a result of the terms of trade shock. The extent of the disequilibrium will depend on whether wages are inflexible in terms of exportables, as was assumed above, or inflexible in terms of importables or an index of all three goods. The reason for this, of course, is that if wages are flexible in terms of importables, no unemployment will result because real wages in terms of importables will increase. If, however, real wages are inflexible measured in terms of a price index that includes importables and exportables, unemployment may result if the weight of importables in the price index is sufficiently small.

It is interesting to note that if the decline in the price of importables is due to a tariff reduction rather than to a terms of trade shock, this possible short-run unemployment effect might call for a second-best argument in favor of a gradual reduction in tariffs. (The first-best policy, of course, would be to remove the minimum wage distortion.) This would be the case, for example, if the maximum amount of capital that can move across sectors in each period is small compared to the total desired capital reallocation given the relative price changes (see S. Edwards 1982). A potential problem with gradual trade reform, however, is that it may result in a loss in credibility. With expectations of a reversal of tariff reform, no capital will actually be moved, and unemployment will take place.

What happens in the long run in this case with an economy-wide minimum

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7. See Neary (1982) and S. Edwards (1982) for discussions of trade liberalization, sticky wages, and unemployment. It is interesting to note that an effect of this type can be used to analytically derive short-run output losses following a trade liberalization process, as is done by Khan and Zahler (1983). For a comprehensive synthesis of the literature on this topic, see Neary (1985).

8. S. Edwards (1982) has shown that if the weight of exportables is "sufficiently" large, a positive terms of trade shock will result in short-run unemployment. A "sufficiently large" weight of exportables is defined as $\alpha > P_0 F_{L0}/(P_0 F_{L0} + P_0 F_{L1})$, where $F_{L0}$ is the second derivative of the production function relative to the amount of labor. If $N_0$ is added, a similar expression is obtained.
wage? As time passes capital can move across sectors, and it will flow steadily out of the importables sector. As was shown in section I, as long as there is no specialization in production, the Stolper-Samuelson result will hold in the long run. When the world price of importables declines, real wages in terms of all goods will go up, rendering the preexisting downwardly inflexible real wage redundant. As capital is reallocated out of importables, unemployment will fall until it completely disappears. In this case unemployment will be only a short-run phenomenon. The long run will be characterized by full employment and higher real wages. Naturally, this result would not hold if the terms of trade shock were negative (for example, an increase in the price of importables). In that case, with an economy-wide minimum wage, the long-run equilibrium would be characterized by unemployment.

Sector-Specific Wage Rigidity

In most countries, minimum wages do not cover all sectors but are generally enforced only for the urban sector. The analysis of labor market adjustment to externally generated relative price shocks in the presence of sector-specific minimum wages can get quite complicated. The analysis that follows focuses on the case of a minimum wage that applies to the importables sector, which is consistent with the stylized fact that in most developing countries minimum wage legislation covers the manufacturing sector only. To facilitate the diagrammatical exposition, the minimum wage is assumed to be expressed in terms of exportables.

Consider now the case of a binding minimum wage in the importables sector only. In order to analyze this case, the diagrams used previously must be somewhat modified. Figure 7 is similar to figure 3, except that in figure 7 total labor used in the importables sector is measured from the right-hand side origin $O_M$. The wage rate $W_M$ is the minimum wage in the importables sector (that is, manufacturing); $L_M$ is employment in this sector. Curve $qq$ is a rectangular hyperbola known as the Harris-Todaro locus, along which the following equation is satisfied:

$$W_I = W_X = \frac{L_M}{L_M + U} W_M,$$

where $U$ is the equilibrium level of unemployment. In the absence of a minimum wage, equilibrium is attained at point $Z$. With a minimum wage, however, the intersection of $(L_X + L_M)$ with $qq$ at point $S$ gives the wage rate in the uncovered (no minimum wage) sectors, employment in each sector, and total unemployment. The distance $ORL_X$ is total employment in the exportables

9. This formulation, of course, follows from Harris's and Todaro's (1970) classical article on migration (see also Harberger 1971). For the use of this discussion in the context of a two-sector economy, see Corden and Findlay (1975) and Neary (1981). Notice that for exposition purposes, the wage rate in importables is assumed to be fixed with respect to exportables. See Neary (1981) for an illustration of what will happen if this assumption is changed.
Figure 7. Labor Market Equilibrium before a Reduction in the World Price of Importables in an Economy with a Minimum Wage in the Importables Sector

The short-run (with capital immobile across sectors) effects of a reduction in the world price of importables are illustrated in figure 8. As a result of the decline in the world price of importables, demand for labor in that sector shifts downward. At the given minimum wage, $W_M$, total demand for labor in the importables sector will decline. The new demand for labor in the importables sector (not drawn) will intersect $W_M^*T$ at $A$. Now labor demanded by the importables sector is reduced to $O_M^*L_M^*$. A new rectangular hyperbola $q'q'$ passes through $A$.

What will happen to wages and employment in the uncovered sectors, and to unemployment? Under the assumption that the price of nontradables remains constant, curve $(L_X + L_N)$ remains at its original location, and point $B$, given by the intersection of $q'q'$ and $(L_X + L_N)$, is the new equilibrium. The new equilibrium is characterized by a lower wage and higher employment in

10. There is an important difference between this type of minimum wage model in which total availability of labor to the economy is given and models with an upwardly sloping aggregate supply of labor. On this last type of model, see A. C. Edwards (1986), and S. Edwards and A. C. Edwards (1987).
Figure 8. *Short-Run Labor Market Adjustment to a Reduction in the World Price of Importables in an Economy with a Minimum Wage in the Importables Sector*

The uncovered sectors. As discussed above, however, the improvement in the terms of trade will affect the price of nontradables and \((L_X + L_N)\) will not remain constant. Under the assumptions discussed above in the subsection on terms of trade shocks, relative prices, and structural adjustment, the improvement in the terms of trade generates a reduction in the price of nontradables, which is, however, smaller than the decline in the price of importables. As a result, in the final short-run equilibrium, \((L_X + L_N)\) will shift downward to \((L_X + L_N)'\) (not drawn). The intersection of \((L_X + L_N)'\) and the \(q'q''\) rectangular hyperbola at point C is the final equilibrium when capital is locked in its sector of origin.

Under the given assumptions, the post-terms of trade shock equilibrium is characterized by the following: (1) lower employment in the sector covered by the minimum wage (importables); (2) lower wages in the uncovered sectors, expressed in terms of exportables; (3) either higher or lower equilibrium unemployment; (4) either lower or higher employment in nontradables; and (5) higher employment and production in exportables.¹¹

¹¹. In this setting, unemployment is given by \(U = L_m (\bar{W}_m / W_N - 1)\). Because \(L_m\) declines and \(\bar{W}_m / W_N\) goes up, it is not possible to know a priori which way \(U\) will go. The final direction will depend on the elasticities of demand for labor in each sector.
Not surprisingly, the case of partial minimum wage coverage generates very different results than the case of an economy-wide minimum wage. First, under partial coverage, there is an increase in production and employment in exportables. Second, under partial coverage, employment in nontradables may also increase. Also, in the short run, a positive terms of trade shock can result in a reduction in the equilibrium level of unemployment in the case of partial minimum wage coverage, whereas greater unemployment always results after such a shock in the case of an economy-wide minimum wage. This illustrates an important finding: in the presence of labor market distortions, exogenous shocks usually considered to be beneficial may generate nontrivial (short-run) unemployment problems.

What will happen in the long run in this case with a sector-specific minimum wage? In the short run, after the world price of importables has gone down, the real return to (sector-specific) capital will be different across sectors. The terms of trade shock reduces the return to capital in the importables (manufacturing) sector and increases it in the exportables and nontradables sectors. Of course, this situation with different real returns to capital cannot continue in the long run. As time goes by, capital will be reallocated, moving out of importables and into the other sectors. In terms of figure 8, this means that $L_M$ will shift downward—and with it the rectangular hyperbola $qq$—while demand for labor in the uncovered sectors will shift upward. Moreover, these curves will shift in such a way that the final outcome will be characterized by a higher wage in the absence of wage rigidities.

The final long-run equilibrium will have to satisfy two conditions: the return to capital will be equalized across sectors and the labor market will be in equilibrium, in the sense that $W_N = W_X = \{L_M/(L_M + U)\} W_M$. As capital is reallocated, employment in the importables sector declines and employment in the exportables and nontradables sectors increases in relation to the short-run levels depicted in figure 8. It is not possible, however, to know a priori whether wages in the uncovered sectors (nontradables and exportables) will be higher or lower in the long run than their initial levels. This will depend on the elasticities of substitution and on the relation between the slopes of the $L_M$, $qq$, and $(L_X + L_N)$ curves.

III. Summary and Concluding Remarks

The way in which labor markets react to disturbances generated in the external sector has important policy implications, particularly in terms of the employment effects of tariff liberalization reforms. For obvious political economy reasons, governments will generally try to avoid the generation of high unemployment: the costs of unemployment are recognized in the short run, while the benefits associated with the structural reforms that provoked the unemployment (that is, trade liberalization) are usually reaped in the medium run, when a different government is likely to be in office.
This article has analyzed the reaction of labor markets in open economies to terms of trade disturbances and tariff liberalization reforms. In section I a three-goods trade model was developed to investigate how sectoral labor allocations and wages react to shocks in the terms of trade. The analysis looked at both the short and long runs and, in the tradition of standard trade theory, assumed that total labor supply is given. Under the assumption of flexible wages, it was shown that labor will move to a particular sector in the short run, only to move out of it in the longer run. This brings up the issue of adjustment costs and the role of expectations in determining labor movements. Section II introduced wage rigidities in the form of an economy-wide minimum wage and a sector-specific minimum wage. It was shown that even when importables are capital intensive, and the minimum wage is expressed in terms of the exportable good, a positive terms of trade shock will generate unemployment in the short run. The labor market reaction will depend, however, on the extent of the minimum wage coverage.

An important policy implication of the analysis is that under inflexible wages there are strong presumptions that a gradual, preannounced trade reform will be able to avoid some of the unemployment costs associated with the reform. This, however, will require that the reform be credible. If the public expects the trade liberalization to be reversed, investment in the export-oriented sectors will not take place, and unemployment will tend to persist.

The model developed in this article has ignored the role of intermediate inputs. If, however, imported intermediate goods are introduced into the analysis, there will be additional channels through which disturbances emanating from the external sector will affect the labor market (see S. Edwards forthcoming).

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The Impact of Landownership Security: Theory and Evidence from Thailand

Yongyuth Chalamwong and Gershon Feder

This article develops a model of farmers' land acquisition and investment decisions. The model clarifies the relation between land values, landownership security, and credit markets. The risk of eviction on untitled lands and the advantages in access to credit associated with titled land are shown to account for the higher price of titled land. Furthermore, observed land prices are distorted when credit is priced below the opportunity cost of capital and the risk of eviction is positive. Therefore social benefit analysis of land titling cannot utilize land prices without correcting for these distortions. The article offers formulas for performing such corrections. Econometric estimates of the value of legal ownership in three provinces of Thailand using cross-section land price data show a statistically significant effect of ownership security on land price. The econometric estimates of ownership security are combined with the formulas generated by the model to yield estimates of the social benefit of land titling in the three provinces. The analysis implies that granting full legal ownership to squatters can be a socially beneficial policy in many provinces.

The evolution of individual land rights in rural areas and of enforcement mechanisms to implement and maintain them is closely related to increases in population density and to advances in agricultural technology. As land becomes scarce, societies that practice shifting cultivation or long fallow periods to maintain land fertility must adopt fertility-restoring technologies that will allow continuous exploitation of land. Such technologies require investment of both capital and effort and an incentive for cultivators to undertake these expenses. Such an incentive is enhanced when the right to cultivate continuously and to transfer a given tract of land is secured and enforced by an effective legal system. An almost universal institution for enforcing land rights is a unified

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A more detailed presentation of the material in this article is forthcoming in Gershon Feder, Tongroj Onchan, Yongyuth Chalamwong, and Chira Hongladarom, Land Policies and Farm Productivity in Thailand (Baltimore, Md.: Johns Hopkins University Press). The work reported in the article was carried out as part of a Bank-sponsored study on "Land Title Security and Farm Productivity in Thailand" (RPO-673-33). The authors gratefully acknowledge the helpful comments of many colleagues and three anonymous reviewers.

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system of land registration and documentation in which the state provides landowners with proof of ownership of well-defined tracts of land.

Agricultural development is almost uniformly related to the emergence of rural credit markets, both formal and informal. Credit transactions often require the availability of explicit or implicit collateral. Land is an attractive collateral, provided that the owners-borrowers can assure the lender of their ability to transfer the land. A unified land registration system is a mechanism for providing the lender with such an assurance.

It follows that the institution of land registration and titling can have significant economic consequences in the agricultural sector. The purpose of this article is to gain both qualitative and quantitative insights on the economic implications of land titles through an analysis of land values in rural Thailand. Land values reflect the economic benefits generated by land and are therefore a plausible indicator for investigation in a study of the effects of secured (titled) ownership.

Much of the literature concerned with the valuation of agricultural land pertains to the United States (Pope and others 1979; Barry 1980; Castle and Hoch 1982; Shalit and Schmitz 1982, 1984; Pope 1985). This literature does not address the implications of ownership insecurity and the value of titling, which are more relevant in many developing countries, where property rights in the rural sector are neither well defined nor strictly enforced.

A relevant line of work can be found, however, in the analysis of housing values in cities of developing countries where squatter settlements are common (Jimenez 1982, 1984). Housing values in cities are analogous to land values in the agricultural context, and the risk of eviction plays a similar role, conceptually, in affecting decisions regarding investment in improved housing or farm capital. The impact of titled ownership on the supply of credit, however, may be more pronounced in the rural context and may cause variation in land prices even when the risk of eviction is small.

Thailand is an interesting case study on the value of secure ownership because bureaucratic constraints on titling in certain areas created a situation in which farmers with and without land documents operate side by side. This offers methodological advantages, because a cross-section study can provide insights that would otherwise require a more complicated time-series analysis. This article uses cross-section data on land prices in rural Thailand in order to estimate the value of ownership security. These estimates are used to evaluate the social benefits that may be expected to result from adoption of a policy granting secure legal ownership to squatters.

The structure of the article is as follows: section I presents background on land institutions in rural Thailand. It is followed by the presentation of the analytical framework and the formal model that underlie the empirical discussion in the subsequent section. Welfare implications and conclusions are presented in the last two sections.
I. LANDOWNERSHIP SECURITY IN THAILAND

Historically, all land in Thailand belonged, at least theoretically, to the king. Widespread forest clearing, settlement, and cultivation were tolerated, however, with few restrictions and little government control until fairly recent times.

The opening of the country to international trade and the increased commercialization of rice production in the second half of the nineteenth century generated a demand for well-defined land rights. Title documents for rice land were established in the main rice producing areas in the 1860s through the 1880s. Several modifications of the land law have been enacted since then, culminating in the Land Code of 1954.

The code defines two types of secure land documents: NS-4 and NS-3 (or NS3-K). The NS-4 document is a full and unrestricted legal title. The NS-3 or NS3-K documents are “certificates of utilization,” which enable the owner to sell, transfer, and legally mortgage the land. They contain a demarcation of land boundaries, but they differ from the NS-4 in the accuracy of the demarcation. It is argued that there is little difference between full title and NS-3K or NS-3 and that “banks will lend equally, irrespective of whether the land has a title or a certificate of utilization” (Williamson 1983, 10). As the occurrence of full-title deeds (NS-4) is practically nil in our study areas, the NS-3 and NS-3K documents are classified as “titled land” in the analysis.

It is estimated that at least 5 million hectares (21 percent of land under private occupation in Thailand) officially classified as forest reserve land is actually under cultivation by squatters. Even though many of these squatters have had de facto possession of the land for ten to twenty years, they cannot obtain titles or certificates of utilization. All types of land (whether legally possessed or not) are freely traded despite the fact that some types are not legally transferable (Lin and Esposito 1976; Kemp 1981). It is simply beyond the capacity of the government to enforce the law.

This study is based on samples of farmers from two different regions in Thailand, namely, the central (Lop Buri province) and northeast (Nakhon Ratchasima and Khon Kaen provinces). These regions were selected because they contain areas in which farmers with secure landownership (outside forest reserve) operate near farmers with insecure ownership (inside forest reserve). The plots of land in the forest reserve areas are untitled, whereas the plots located outside the forest reserves are mostly titled.

Titled and untitled farmers in the survey area stated that the most important benefit of having title is its use as collateral for loans. The next ranking benefit was the avoidance of eviction and the minimization of disputes (Chalamwong and Feder 1985). Given that the incidence of eviction from public agricultural land in Thailand in the past twenty-five years has been infrequent (see table 1), the data suggest that the main benefit of land documentation in the Thai
Table 1. Sampled Farmers’ Lifetime Experience with Eviction and Disputes, Thailand

<table>
<thead>
<tr>
<th>Province</th>
<th>Lop Buri</th>
<th>Nakhon Ratchasima</th>
<th>Khon Kaen</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Untitled farmers (N = 100)</td>
<td>Titled farmers (N = 84)</td>
<td>Untitled farmers (N = 89)</td>
</tr>
<tr>
<td>Item</td>
<td>Evictions</td>
<td>Disputes</td>
<td>Land purchase</td>
</tr>
<tr>
<td></td>
<td>7.0</td>
<td>13.0</td>
<td>71.5</td>
</tr>
<tr>
<td></td>
<td>2.4(a)</td>
<td>35.7</td>
<td>69.5</td>
</tr>
<tr>
<td></td>
<td>(214)(b)</td>
<td>(211)</td>
<td>(279)</td>
</tr>
</tbody>
</table>

a. Eviction rates reported by titled farmers reflect normal expropriation with compensation for public projects such as roads and canals.
b. Figures in parentheses indicate the numbers of titled or untitled plots sampled.

Source: World Bank data.

context is derived from the improved access to credit. Econometric analysis shows that credit supply in Thailand is significantly affected by titled ownership and by the provision of land collateral (Feder and others 1986). The data also confirm that the land market is reasonably active both in and outside forest reserve areas (table 1, line 3). This background underlies the formal model of the determination of equilibrium land prices presented in the next section.

II. TENURE SECURITY, FARM PRODUCTIVITY, AND LAND VALUES: AN ANALYTICAL FRAMEWORK

Insecure ownership causes uncertainty regarding the land operator’s ability to benefit from investments. Investment is expected to be negatively related to the level of uncertainty regarding tenure. A clear formal title backed by a legal system capable of enforcing property rights reduces or eliminates the uncertainty regarding tenure.

The role of secure legal title in providing farmers with access to cheaper, longer term, and more extensive credit is highlighted by many studies. Possession of land title is often a prerequisite for commercial or official bank loans that require collateral (Dorner and Saliba 1981, p. 23). A secure title may thus provide easy access to credit, especially from formal lenders who do not have personal and detailed information on the potential borrower. Interest rates in the formal sector are significantly lower than those in the informal sector.

It follows that ownership insecurity causes lower farm productivity due to lack of investment incentives and limited access to credit (Dorner and Saliba 1981). Empirical evidence directly linking secure titles to farm productivity is rather scant (Feder 1987). However, a recent study of the economic value of secured ownership in the context of urban housing using hedonic price analysis (Jimenez 1984) offers a plausible indirect approach: since the price of agricul-
tural land is related to its productive potential over a long time horizon, land values can be used to analyze the relation between ownership security and farm productivity and thus to provide estimates of private and social benefits of ownership security.

Although the assumptions of the model outlined below reflect circumstances in Thailand, they are also compatible with the situation in many other developing countries. Several simplifications are made for the sake of presentation, but most of these do not detract from the applicability of results to more general cases.

Assumptions

Land Market. (a) Land is of uniform quality but differs in its registration status. Untitled land cannot be transformed into titled land by the farmer. (b) All land can be bought and sold. (c) Land is divisible, but because of transportation considerations, a farmer can have either titled or untitled land, but not both.

Credit Market. (a) Farmers can get credit only if they provide collateral. Farmers are credit-rationed. (b) Interest rates are fixed. (c) The supply of credit is related to the value of titled land owned, which serves as collateral. (d) Credit can be used (together with initial wealth) to finance land purchase and investment in capital.

Production. The production function exhibits constant returns to scale in land and capital.

Farmers. Farmers maximize their terminal wealth. They start with a given endowment of wealth and must choose whether to purchase titled or untitled land. Given their choice of type of land, farmers decide the amount of land to be purchased (which determines the value of investment in capital, given the constraint on credit).

Notation

Variables (subscripts $t$ and $nt$ stand for titled and nontitled farms, respectively): $A_t, A_{nt} =$ amount of land; $P_t, P_{nt} =$ price of land; $K_t, K_{nt} =$ capital;

1. This is a simplification. The sample underlying the present study shows that less than 20 percent of the farmers had both titled and untitled land. As the sample was deliberately taken in areas close to the boundaries between forest reserve and other land, the average incidence of mixed ownership is likely to be even lower.

2. The characterization of the credit market is based on the empirical analysis in Feder and others (1986). Most of the long- and medium-term loans observed in the sample were secured by land collateral. A disequilibrium econometric analysis of supply and demand for institutional credit established that a majority of the borrowers were credit-rationed. The institutional interest rate is fixed by law, whereas the variation in noninstitutional interest rates was small. The analysis demonstrated that land collateral and the value of land are important determinants of institutional credit, and the essence of this result is incorporated in the model.

3. Short-term credit is ignored in this model, as is the use of variable inputs. The extension of the model to include such elements does not alter the results (see Chalamwong and Feder 1985).
\( V_t, V_{nt} = \text{terminal wealth}; \ Y_t, Y_{nt} = \text{output}. \) Note: Lowercase letters denote values of variables per unit of land.

Parameters: \( s = \text{credit per value of one unit of titled land}; \ r = \text{interest rate}; \ W_0 = \text{initial wealth}. \)

**Development of Model Results**

Initially, it is assumed that improved access to credit is the only difference between titled and untitled land. In the subsequent section, the risk of eviction is added.

The optimization problem presented first is that of a farmer who chooses to purchase untitled land (prices of output and inputs are assumed as unity for convenience):

(1) \[
\max V_{nt} = Y(A_{nt}, K_{nt}) + P_{nt} \cdot A_{nt}, A_{nt}^t \]

subject to the budget constraint (where no credit is allowed due to the absence of collateral-eligible land)

(2) \[
P_{nt} \cdot A_{nt} + K_{nt} = W_0.
\]

Employing the constant-returns-to-scale property of production, and substituting for \( K_{nt} \), utilizing the budget constraint (equation 2), the objective function can be written as

(3) \[
\max V_{nt} = A_{nt} \cdot \left( W_0 \cdot P_{nt} + A_{nt} \cdot P_{nt} \right) - \frac{W_0}{A_{nt}} + A_{nt} \cdot P_{nt}.
\]

The first-order condition for optimum is

(4) \[
\frac{dV_{nt}}{dA_{nt}} = y'_{nt} - \frac{W_0}{A_{nt}} \cdot y'_{nt} + P_{nt} = 0,
\]

where \( y' = dy/dk \).

Using the first-order condition, one can verify that the demand for land is negatively related to its price, as intuition would suggest. It can also be shown that the optimal capital-land ratio is positively related to the price of land; as the price of land increases, capital becomes relatively cheaper and is substituted for land (see appendix). Multiplying equation 4 by \( A_{nt} \) and rearranging yields

(5) \[
V^*_{nt} = A_{nt} \cdot (y_{nt} + P_{nt}) = W_0 \cdot y'_{nt},
\]

where the asterisk denotes optimal value. The model thus implies that, at optimum, terminal wealth is equal to initial wealth times the marginal return to capital. A higher price of land reduces the terminal wealth, as less resources are available for capital formation (see appendix).

For the case in which the farmer decides to buy titled land, the objective function is
subject to the budget constraint (which incorporates the credit ration)

\[ P_t \cdot A_t + K_t = W_0 + s \cdot P_t \cdot A_t. \]

Expressing production in per-unit-of-land-terms, and incorporating the budget constraint, yields the objective function

\[
\text{Max } V_t = A_t \cdot Y \left[ \left( \frac{W_0}{A_t} \right) - (1 - s) \cdot P_t \right] + A_t \cdot P_t \cdot \left[ 1 - (1 + r) \cdot s \right].
\]

Note that if \( s = 0 \) (that is, credit is unavailable), the objective function for a farmer buying titled land becomes identical to that of a farmer buying untitled land. The first-order condition for optimum is similar to equation 4:

\[
\frac{dV_t}{dA_t} = Y_t - \left( \frac{W_0}{A_t} \right) \cdot y_t' + \theta \cdot P_t = 0,
\]

where \( \theta = [1 - (1 + r) \cdot s] \).

Multiplying equation 9 by \( A_t \) and rearranging yields

\[
V_t = A_t \cdot (Y_t + \theta \cdot P_t) = W_0 \cdot y_t'.
\]

By analogy to the case of untitled land, it can be verified that an increase in the price of titled land reduces the demand for titled land, increases the optimal capital-land ratio, and reduces the amount of terminal wealth. It can be further shown that optimal terminal wealth increases with the credit allocation parameter \( s \), as the availability of more credit enables more investment and land acquisition.

In equilibrium, the value of terminal wealth for a farmer has to be identical whether he/she selects to buy titled or untitled land \( (V_t^* = V_m^*) \); otherwise, one type of land will be preferred by all farmers. It is clear that the prices of the two types of land cannot be identical in equilibrium because with identical prices, the value of terminal wealth on titled land is higher due to the advantage in access to credit. The price of titled land is thus higher than the price of untitled land, equalizing the value of terminal wealth on the two types of land.

An extension of this result is the hypothesis that when credit advantages due to the possession of title are small \( (s \text{ is small}) \), the difference between the prices of titled and untitled land will be small (see appendix). Viewing \( s \) broadly as a parameter reflecting differential access to credit by titled and untitled farmers, one would expect \( s \) to be smaller in an area where most credit is provided by noninstitutional lenders. Such lenders are less inclined to require collateral, as they have alternative enforcement options, and therefore the difference between titled and untitled farmers’ access to credit will be smaller.

The equilibrium concept referred to above (that is, equality of the optimized
terminal wealth) does not determine unique equilibrium prices, as there are infinitely many pairs \((P, P_n)\) satisfying \(V_t^* = V_{nt}^*\). One simple way of "closing" the model is by considering a third investment opportunity, not related to land cultivation, with a fixed rate of return, say \(\delta\). In equilibrium it must hold, in view of equations 5 and 10, that

\[
W_0 \cdot (1 + \delta) = W_0 \cdot y_t' = W_0 \cdot y_{nt}'.
\]

Given the monotonic negative relation between the optimal value of terminal wealth and land prices, there is a unique pair of equilibrium prices for titled and untitled land satisfying equation 11.

**Introducing the Risk of Eviction**

The model will now be expanded to incorporate the assumption that there is a nonzero probability (say, \(\Psi\)) that farms established on untitled land will lose a proportion, say \(1 - \gamma\), of the land because of eviction. Because the model does not allow a distinction between periods before and after eviction, it is assumed that if eviction takes place, a proportion of \(1 - \gamma\) of output is lost as well. For simplicity, risk-neutrality is assumed. However, results can be shown to hold with a mean-standard deviation objective function (Thomson and Hazell 1972). Farmers facing a risk of eviction are thus assumed to maximize the expected value of terminal wealth:

\[
\text{Max } E(V_{nt}) = (1 - \Psi) \cdot A_{nt} \cdot (y_{nt} + P_{nt}) + \Psi \cdot \gamma \cdot A_{nt} \cdot (y_{nt} + P_{nt})
= (1 - \Psi + \gamma \cdot \Psi) \cdot A_{nt} \cdot (y_{nt} + P_{nt}).
\]

The first-order condition for maximum of this modified equation is

\[
(1 - \Psi + \gamma \cdot \Psi) \cdot [y_{nt} - \frac{W_0}{A_{nt}} \cdot y_{nt}' + P_{nt}] = 0.
\]

This condition is practically identical to equation 4, and all the comparative static results discussed earlier hold. However, utilization of equations 12 and 13 shows that equation 5 needs to be modified in the presence of risk, namely

\[
E(V_{nt}^*) = W_0 \cdot [1 - \Psi \cdot (1 - \gamma)] \cdot y_{nt}'.
\]

In equilibrium, the value of the objective function for a farmer buying untitled land or titled land should be identical. Thus, when risk of eviction is present, the analog to equation 11 is

\[
y_t' = [1 - \Psi \cdot (1 - \gamma)] \cdot y_{nt}' = 1 + \delta.
\]

It can be further shown that the equilibrium price of untitled land is negatively affected by the risk of eviction, as intuition would suggest.

The model thus generates the hypothesis that titled land will have a higher price than untitled land because of advantages in access to credit or a risk of eviction associated with untitled land, or both.
III. EMPIRICAL RESULTS

In this section evidence is provided substantiating the hypothesis that titled land has a higher price than untitled land of equal quality. Land of lower productive quality (that is, poorer soil) or land located less favorably (that is, further away from the market) is expected to sell for a lower price, given the same title status. In order to test these hypotheses, data were collected on the value of farm land from a sample of landowners in 1984–85. The sample included both titled and untitled farmers (the latter mostly squatters in national forest reserve land) who were asked to assess the market value of their land, given its registration status and quality.\(^4\)

The data provided by farmers on the value and physical attributes of each tract of land are utilized in a hedonic price analysis. The specification of hedonic price equations is typically arbitrary, and Box-Cox procedures are used to estimate a maximum likelihood nonlinear formulation (Jimenez 1984). However, the model of the preceding section can be utilized to generate a tractable hedonic price equation if a Cobb-Douglas specification is assumed for the production function. Denote

\[
Y = K^a \cdot A^{1-a} \cdot e^\alpha,
\]

where \(Y\), \(K\), and \(A\) were defined earlier, \(e\) is a composite indicator of land quality, and \(\alpha\) is a parameter.

It can be shown (see appendix) by utilizing equations 15, 13, and 9 that the equilibrium price of land can be written as

\[
\ln P = H_0 + H_1(s) + H_2(\Psi) + \frac{\mu}{(1 - \alpha)}\]

where \(H_1\) and \(H_2\) are positive constants such that \(dH_1/ds > 0\), \(dH_2/d\Psi < 0\). Suppose that \(\mu\) is a linear combination of land quality indicators. Equation 17 can then be estimated straightforwardly, with a dummy variable for titled plots, representing the shift in the intercept due to the higher values of \(H_1\) and \(H_2\). The value of this title dummy variable thus represents both the security and credit effects of legal ownership.

A more refined hypothesis can also be tested using this approach. There are some holdings in the sample which are not titled but which are located outside the boundaries of the forest reserves. These tracts can be titled, and there is at present no risk of eviction to the owner. The perceived ownership security of these plots is therefore fairly similar to that of titled plots. However, in the absence of formal ownership documents, institutional lenders must treat the

\(^4\) In the absence of specialized assessors in the rural areas of Thailand, there was no other way to obtain the current market value of land. Jimenez (1984) used data obtained in a similar manner for values of urban dwellings in legal and illegal settlements.
owners of such holdings the same as they do farmers with holdings in forest reserve areas (which are subject to a risk of eviction).

Technically, such plots are characterized by $\psi = 0$ as well as $s = 0$. The constant term in the price equation for such plots is therefore smaller than that in the equation for titled plots, but it is larger than the constant term in the equation for untitled plots in the forest reserve. Put differently, the price of untitled plots outside the forest reserve is expected to be higher, other things being equal, than the price of untitled plots in the forest reserve, but lower than the price of titled plots. Because the price equations for the three types of plots differ only in the intercept, a single equation can be estimated, with dummy variables for titled plots and for untitled plots outside the forest reserve. The dependent variable is the natural logarithm of the price of a unit of land (expressed in local currency).

The sets of land characteristics that may affect productivity or farm gate prices (explanatory variables) are as follows:

**Natural attributes:** soil type (black, not black); slope (flat, not flat); lowland/upland; irrigation (year-round, seasonal)/rainfed; and suitability for sugarcane (only in Khon Kaen province).

**Land improvements:** bunds, land leveled by farm machinery, fruit trees on the land, and land cleared of stumps.

**Location and transportation:** all-weather road to the nearest market, time required to reach the nearest market (in minutes), all-weather road to the village, and time required to reach the village (in minutes).

Most of these variables affect the productive potential of the land or the cost of cultivation (for example, slope, bunds). Fruit trees provide an additional source of income. Favorable location increases the farm gate price of output or reduces the effective cost of inputs.

Estimation results are presented in table 2. It is clear that legal title is a significant factor in explaining the variation in land prices. In all three provinces, the parameter for the title dummy variable is significantly greater than zero at a 99 percent confidence level. There is a substantial difference in value of the parameter in Lop Buri province, where it is less than one-third of its value in the other two provinces. A possible explanation for this result is presented below.

As hypothesized, for all three provinces the parameter of the dummy variable for untitled plots outside the forest reserve is positive and significantly smaller (at a 95 percent confidence level) than the parameter of the dummy variable for titled land. It is significantly greater than zero in Nakhon Ratchasima and Khon Kaen provinces (at 94 and 95 percent confidence levels, respectively), implying that untitled land outside the forest reserve is more valuable than untitled land in the forest reserve, apparently because ownership of land outside the forest reserve is not challenged by the state and there is no risk of eviction. In Lop Buri province, there is no statistically significant difference in value between untitled land within and that outside the forest reserve, but the param-
Table 2. Parameter Estimates from Hedonic Price Analysis, Thailand

<table>
<thead>
<tr>
<th>Variable</th>
<th>Lop Buri</th>
<th>Ratchasima</th>
<th>Khon Kaen</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Estimate</td>
<td>Estimate</td>
<td>Estimate</td>
</tr>
<tr>
<td><strong>Ownership security variables</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Title (D)</td>
<td>0.2264</td>
<td>0.8431</td>
<td>0.7605</td>
</tr>
<tr>
<td></td>
<td>(5.48)</td>
<td>(14.29)</td>
<td>(11.10)</td>
</tr>
<tr>
<td>Untitled out of forest reserve (D)</td>
<td>0.0516</td>
<td>0.1597</td>
<td>0.2018</td>
</tr>
<tr>
<td></td>
<td>(0.67)</td>
<td>(1.63)</td>
<td>(1.77)</td>
</tr>
<tr>
<td><strong>Natural attributes</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black soil (D)</td>
<td>0.0351</td>
<td>0.1855</td>
<td>0.0424</td>
</tr>
<tr>
<td></td>
<td>(0.55)</td>
<td>(2.84)</td>
<td>(0.51)</td>
</tr>
<tr>
<td>Flat slope (D)</td>
<td>0.0516</td>
<td>0.0102</td>
<td>0.1210</td>
</tr>
<tr>
<td></td>
<td>(0.90)</td>
<td>(0.18)</td>
<td>(1.66)</td>
</tr>
<tr>
<td>Lowland (D)</td>
<td>0.1722</td>
<td>-0.0304</td>
<td>0.1257</td>
</tr>
<tr>
<td></td>
<td>(2.51)</td>
<td>(0.47)</td>
<td>(1.70)</td>
</tr>
<tr>
<td>Year-round irrigation (D)</td>
<td>0.1398</td>
<td>0.2884</td>
<td>0.1112</td>
</tr>
<tr>
<td></td>
<td>(2.29)</td>
<td>(2.60)</td>
<td>(0.62)</td>
</tr>
<tr>
<td>Seasonal irrigation (D)</td>
<td>0.0865</td>
<td>0.2723</td>
<td>-0.0454</td>
</tr>
<tr>
<td></td>
<td>(1.79)</td>
<td>(4.30)</td>
<td>(0.25)</td>
</tr>
<tr>
<td>Suitability for sugarcane (D)</td>
<td>c</td>
<td>c</td>
<td>0.0450</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.51)</td>
</tr>
<tr>
<td><strong>Land improvements</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bunds (D)</td>
<td>-0.0579</td>
<td>0.4148</td>
<td>0.2474</td>
</tr>
<tr>
<td></td>
<td>(1.21)</td>
<td>(6.80)</td>
<td>(3.48)</td>
</tr>
<tr>
<td>Leveling (D)</td>
<td>0.1030</td>
<td>-0.0122</td>
<td>-0.076</td>
</tr>
<tr>
<td></td>
<td>(1.75)</td>
<td>(0.20)</td>
<td>(0.93)</td>
</tr>
<tr>
<td>Fruit trees (D)</td>
<td>0.0649</td>
<td>-0.0082</td>
<td>0.0751</td>
</tr>
<tr>
<td></td>
<td>(1.47)</td>
<td>(0.15)</td>
<td>(1.17)</td>
</tr>
<tr>
<td>Cleared of stumps (D)</td>
<td>d</td>
<td>0.1226</td>
<td>0.0163</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1.69)</td>
<td>(0.22)</td>
</tr>
<tr>
<td><strong>Location and transportation</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All-weather road to market (D)</td>
<td>d</td>
<td>0.1027</td>
<td>0.2122</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1.32)</td>
<td>(2.25)</td>
</tr>
<tr>
<td>Travel time to market</td>
<td>-0.1053</td>
<td>0.0395</td>
<td>0.0012</td>
</tr>
<tr>
<td></td>
<td>(3.62)</td>
<td>(1.19)</td>
<td>(0.027)</td>
</tr>
<tr>
<td>All-weather road to village (D)</td>
<td>0.0937</td>
<td>0.0924</td>
<td>-0.1005</td>
</tr>
<tr>
<td></td>
<td>(2.39)</td>
<td>(1.88)</td>
<td>(1.46)</td>
</tr>
<tr>
<td>Travel time to village</td>
<td>-0.0277</td>
<td>-0.0440</td>
<td>-0.0355</td>
</tr>
<tr>
<td></td>
<td>(1.57)</td>
<td>(1.67)</td>
<td>(1.14)</td>
</tr>
<tr>
<td><strong>Constant</strong></td>
<td>1.1910</td>
<td>0.5316</td>
<td>0.6659</td>
</tr>
<tr>
<td></td>
<td>(10.24)</td>
<td>(2.78)</td>
<td>(2.77)</td>
</tr>
<tr>
<td><strong>R²</strong></td>
<td>0.183</td>
<td>0.578</td>
<td>0.389</td>
</tr>
<tr>
<td><strong>F-value</strong></td>
<td>7.165</td>
<td>47.410</td>
<td>17.090</td>
</tr>
<tr>
<td><strong>Number of observations</strong></td>
<td>431</td>
<td>536</td>
<td>447</td>
</tr>
</tbody>
</table>

a. (D) = Dummy variable.
b. Numbers in parentheses are Student "t" values.
c. Sugarcane not grown in the province.
d. Practically all observations have the same value for this variable.
eter for the latter type of land is about one fifth the parameter for titled land, a ratio almost identical to that observed in the other two provinces. Following the interpretation discussed above (see equation 17), the results suggest that the value of titled land attributable to security from eviction is only a small component (one fifth) of the total value of titled land, and that most of the value appears to derive from improved access to credit.  

The results for the other explanatory variables are mostly as anticipated: of 38 parameters estimated (for the three provinces combined), 29 have the expected sign, and none of those that have a counterintuitive sign is (statistically) significantly different from zero. Among the parameters with the expected sign, 17 are significant at a 95 percent (one-tailed) confidence level. The regression results imply that the value of equal-quality untitled land is 80, 43, and 47 percent of the value of titled land in Lop Buri, Nakhon Ratchasima, and Khon Kaen provinces, respectively.

IV. Social Benefits of Titling

Having estimated the impact of titles on land prices, it is possible to calculate the social benefits of a policy granting titles to owners of untitled land. It is assumed that there is no environmental impact (that is, loss of forest land or game reserve), because, in the Thai context, the discussion deals with untitled lands that have been settled for many years but that are formally classified as “forest reserve lands.” Presently, the law does not allow the granting of title on such lands. Given the suggestion above that access to credit is the main factor underlying the economic effects of land titles in Thailand, the realization of a significant impact from titling requires an increase in the overall supply of credit to agriculture. The calculation of the social benefits of titling assumes that policies to facilitate such an increase are enacted.

The calculation of the contribution to social welfare generated by a unit of untitled land requires a specification of the public benefit derived from lands from which squatters have been evicted. Assuming that such benefits are zero, equation 13 can be rearranged so that the left side represents expected social benefits

\[
(18) \quad [1 - \Psi \cdot (1 - \gamma)] \cdot \gamma_{nt} - k_{nt} \cdot (1 + \delta) = \delta \cdot P_{nt} + \Psi \cdot (1 - \gamma) \cdot P_{nt},
\]

where use has been made of the equilibrium condition (equation 15) and the

5. It could be argued that part of the difference in values between titled and untitled plots derives from avoidance of land disputes. However, the evidence presented in table 1 indicates that land disputes in untitled areas are not more frequent than in titled areas.

6. As a check for the robustness of the model, the approach utilized by Jimenez (1984) was replicated. That is, regression estimates were obtained separately for the subsamples of titled and untitled farmers, and parameter values were used to impute the land value in the other sample. The mean difference of the imputed and actual values is an estimate of the value of title. The estimates obtained in this manner are very close to those estimated directly in table 2.
budget constraint (equation 2). The left side of equation 18 represents the expected contribution to social welfare of one unit of land, net of the cost of resources consumed in the process of production. Real capital is evaluated in terms of its social opportunity cost \((1 + \delta)\). Denoting the left side of equation 18 by \(\Pi_{nt}\), and using the opportunity rate of return to capital \((\delta)\) as a discount rate, the discounted value of the benefits derived from a unit of untitled land over an infinite horizon is

\[
\left[ \sum_{i=0}^{\infty} e^{-\delta \cdot i} \cdot \Pi_{nt} \cdot di = P_{nt} \cdot \left[ 1 + \Psi \cdot \left( \frac{1 - \gamma}{\delta} \right) \right], \tag{19}\]
\]

where \(i\) denotes time.

Equation 19 demonstrates a very plausible result, namely, that with a non-zero probability of eviction, the market price of untitled land underestimates the expected discounted value of social benefits forthcoming from such land.

By analogy to equation 18, the optimality condition for titled land (equation 10) can be used on the left side to express the social value of production (net of resource costs) generated in one period by a unit of titled land, that is, the net social benefit to society generated by such land:

\[
y_t - k_t \cdot (1 + \delta) = P_t \cdot \left[ \delta - s - (\delta - r) \right] \tag{20}\]

After denoting the left side of equation 20 by \(\Pi_t\), the calculation of the discounted value of contributions to social welfare generated by a unit of titled land over an infinite horizon yields

\[
\left[ \sum_{i=0}^{\infty} e^{-\delta \cdot i} \cdot \Pi_t \cdot di = P_t \cdot \left[ 1 - s \cdot \frac{\delta - r}{\delta} \right]. \tag{21}\right.

Equation 21 implies that when the opportunity cost of capital \((\delta)\) is higher than the prevailing interest rate (for example, when interest rate ceilings are imposed), the price of titled land is higher than its social value. This is due to the fact that the difference between the opportunity cost of capital and the interest rate is a subsidy accruing to owners of titled land. Although the subsidy is capitalized in the market value of titled land, it does not represent a real contribution to society.

The magnitude of the gross increase in social welfare resulting from allowing the legal registration of a unit of forest reserve land of given quality, expressed as a proportion (say, \(b\)) of the equilibrium price of untitled land of such quality, is obtained by calculating the ratio of the right sides of equation 21 and equation 19, minus one:

\[
b = \frac{P_t}{P_{nt}} \cdot \left\{ \frac{[\delta - s \cdot (\delta - r)]}{[\delta + \Psi \cdot (1 - \gamma)]} \right\} - 1 \tag{23}\]

With a logarithmic specification of the hedonic price equation, the ratio \(P_t/P_{nt}\) is independent of land attributes, and is given by \(e^\eta\), where \(\eta\) is the parameter
of land title in the logarithmic regression reported in table 2. The value of $b$
for the three provinces can be calculated assuming alternative values of the
opportunity cost of capital. Clearly, if there is no risk of eviction and if the
credit market is not distorted, then the benefit can be calculated directly from
the ratio of the prices of titled and untitled lands. When risk and distortion are
present, the market prices need to be adjusted for benefit calculation. The
probability of eviction can be taken as the differential in the rate of eviction
between titled and untitled farmers as reported in table 1. Given that the
government rarely confiscates complete holdings, and that farmers split hold-

ings among family members to minimize the amount of land from which they
are evicted, $\gamma$ is assumed to take the value of 0.7. The parameter $s$ is set at 0.1,
which is the ratio of borrowing to land price observed in the sample. The
nominal institutional interest rate in Thailand at the time of the study (1985)
was 13 percent. However, the real interest rate (taking into account inflation)
was about 8 percent. The estimates of social benefits reported in table 3 show
significant benefit in the northeastern provinces but little benefit in Lop Buri
province. The social benefits are much smaller than the private benefits. The
latter are given by $(P_r/P_m) - 1$.

The calculation of social benefits assumes implicitly that formerly untitled
farmers will receive the same amount of institutional credit that is currently
available to titled farmers. Although credit markets are distorted, the present
calculation considers the real opportunity cost of capital. The results imply
that the gain in agricultural productivity due to titling accompanied by agricul-
tural credit expansion outweighs the losses in other sectors of the economy
(represented by the opportunity cost of capital). The magnitude of benefits
in the northeast is much larger than the costs of registration and titling,
which are estimated to be less than 5 percent of the value of untitled land
(Burns 1985).

The reason for the small benefits to titling in Lop Buri (or the relatively small

<table>
<thead>
<tr>
<th>Opportunity cost of credit ($b$)</th>
<th>Benefits (as proportion of $P_m$) $(b)$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lop Buri</td>
</tr>
<tr>
<td>0.10</td>
<td>0.059</td>
</tr>
<tr>
<td>0.12</td>
<td>0.063</td>
</tr>
<tr>
<td>0.14</td>
<td>0.072</td>
</tr>
<tr>
<td>0.16</td>
<td>0.078</td>
</tr>
<tr>
<td>Private benefit $([P_r/P_m] - 1)$</td>
<td>0.254</td>
</tr>
</tbody>
</table>

7. Alternative calculations were made with a model allowing for risk aversion, yielding smaller estimated benefits but similar ordering among provinces.
difference in the prices of titled and untitled lands) seems to lie in the structure of the credit market in that province, as the risk of eviction is not much lower than in other provinces. Analysis of credit transactions in the three provinces (Feder and others 1986) reveals that in Lop Buri farmers without titled land have access to substantial amounts of credit in the informal market through traders, who account for about 90 percent of informal loans and close to half of all credit. (In other provinces, traders are a negligible source of credit because of the much more limited extent of high-value cash crop cultivation.) Traders do not usually require land collateral in their credit transactions. It therefore follows that in Lop Buri farmers without land titles are subject to less significant disadvantages with respect to credit availability. Following the prediction of the model presented in section II, this implies that the prices of titled and untitled land will differ less in Lop Buri than in the other two provinces (recall that in the absence of credit constraints, prices will differ only according to the risk of eviction).

V. SUMMARY AND CONCLUSIONS

This article has presented an analysis of land prices in rural Thailand, focusing on the value of secure legal titles. The price of legally titled and documented land was shown to be significantly higher than the price of equal-quality land that is illegally held. The difference in land values is due mainly to the credit advantages accruing to owners of documented land and to a lesser extent to the risk of eviction, which is minor in Thailand.

A formal model of investment and production was constructed to provide an analytical framework for the empirical work and to facilitate an assessment of the impact of land-titling policy. It was shown that the divergence between the nominal cost of credit and the opportunity cost of capital will cause the equilibrium price of titled land to be higher than the social value of benefits generated by a unit of such land. The risk of eviction from untitled land will cause the market price of untitled land to be lower than the social value of benefits from such land. Formulas derived from the model were used to estimate the social benefits of releasing for de jure private ownership lands that are presently considered government property (these lands are de facto privately owned). It was shown that significant variation between benefits in different provinces is possible, but that benefits are substantial in provinces where the informal credit market is less developed.

The results estimated in this article suggest that national benefits would occur in Thailand from more intensive titling. The method developed in the article allows the ranking of different areas in terms of the benefits expected, which could be useful in determining priority for testing. In countries where ownership is more insecure than in Thailand, the effects would be even larger than those estimated in this article.
APPENDIX: MATHEMATICAL DERIVATION OF RESULTS

Differentiating equation 4 of the text yields

\[(A-1) \quad - \left( \frac{W_0}{A_m} \right) \cdot y''_m \cdot \left( \frac{dA_m}{dP_m} \right) = \left( \frac{W_0}{A_m} \right) \cdot y''_m + 1 - y'_m. \]

Applying the budget constraint (equation 2) in equation 4 yields

\[(A-2) \quad (1 - y'_m) = - \left( \frac{y_m - y'_m \cdot k_m}{P_m} \right). \]

The right side of equation A-2 is negative, as \( y > y' \cdot k \) due to the concavity of the production function. Concavity also implies that \( y'' < 0 \). It thus follows that \( dA_m/dP_m < 0 \), that is, the demand for land is negatively related to its price. To show that the optimal capital-land ratio is positively related to the price of land, note that by the budget constraint, \( k_m = (W_0/A_m) - P_m \). Thus

\[(A-3) \quad \frac{dk_m}{dP_m} = - \left( \frac{W_0}{A_m^2} \right) \cdot \left( \frac{dA_m}{dP_m} \right) - 1. \]

Using equation A-1 in equation A-3 yields

\[(A-4) \quad \frac{dk_m}{dP_m} = \left[ \frac{(1 - y''_m)}{y''_m} \right] \cdot \left( \frac{A_m}{W_0} \right) > 0. \]

Differentiating equation 5 of the text yields

\[(A-5) \quad \frac{dV_m^*}{dP_m} = W_0 \cdot y''_m \cdot \left( \frac{dk_m}{dP_m} \right) < 0, \]

where the sign is verified using equation A-4.

For the case of titled land, the derivation of results parallel to those described above follows an analogous procedure. To show that terminal wealth increases with the credit parameter \( s \), we first differentiate text equation 9 to obtain

\[(A-6) \quad - \left( \frac{W_0}{A^2 A_m} \right) \cdot y''_m \cdot \left( \frac{dA}{ds} \right) = y'_t \cdot P_t - (1 + r) \cdot P_t - \left( \frac{W_0}{A_t^2} \right) \cdot P_t \cdot y''_m. \]

The assumption of a binding credit constraint implies \( y'_t > (1 + r) \).

Now, differentiating equation 10 yields

\[(A-7) \quad \frac{dV_t^*}{ds} = W_0 \cdot y''_m \cdot \left[ P_t - \left( \frac{W_0}{A_t^2} \right) \cdot \left( \frac{dA_t}{ds} \right) \right]. \]

Using equation A-6 in equation A-7 yields

\[(A-8) \quad \frac{dV_t^*}{ds} = A_t \cdot P_t \cdot [y'_t - (1 + r)] > 0. \]

Consider the pairs of \( P_t, s \) that maintain a constant value of \( V_t^* \). As \( dV_t^*/dP_t < 0 \) and \( dV_t^*/ds > 0 \), it is clear that the larger is \( s \), the larger is the value of \( P_t \), which will maintain a fixed value of \( V_t^* \). In equilibrium \( V_{nt}^* = V_t^* \),
and given the value of $V_{nt}$, the difference between $P_{nt}$ and $P_t$ in equilibrium increases with $s$.

As is evident from equation 13, changes in the risk of eviction $\Psi$ have no effect on the optimal $k_n$ when $P_{nt}$ is given. Thus changes in the risk of eviction affect $k_n$ through the impact on the equilibrium price of untitled land $P_{nt}$.

Differentiation of equation 15 yields

$$[1 - \Psi \cdot (1 - \gamma)] \cdot y''_n \cdot \frac{dk_n}{dP_{nt}} \cdot \frac{dP_{nt}}{d\Psi} = (1 - \gamma).$$

Earlier results established $dk_n/dP_{nt} > 0$, and thus $dP_{nt}/d\Psi < 0$ for equation A-9 to be maintained. That is, the equilibrium price of untitled land is negatively affected by the risk of eviction.

To derive the econometric specification assuming the Cobb-Douglas function (equation 16), note that equation 15 implies

$$R \cdot \alpha \cdot k_{nt}^{\alpha-1} \cdot e^u = 1 + \delta$$

where $R = [1 - \Psi \cdot (1 - \gamma)]$. If $\Psi = 0$, then $R = 1$, and

$$\alpha \cdot k_t^{\alpha-1} \cdot e^u = 1 + \delta.$$

Solving equations A-10 and A-11 for $k_n$ and $k_t$, respectively, substituting for $k_n$ and $k_t$ in the first-order conditions of equations 4 and 9 respectively, and solving for $P_{nt}$ and $P_t$ yields

$$P_{nt} = \left[(\alpha R)^{\alpha/(1 - \alpha)} - (\alpha R)^{1/(1 - \alpha)}\right] \cdot (1 + \delta)^{-\alpha/(1 - \alpha)} \cdot \delta^{-1} \cdot e^{u/(1 - \alpha)}$$

(A-13)

$$P_t = \left[\alpha^{\alpha/(1 - \alpha)} - \alpha^{1/(1 - \alpha)}\right] \cdot (1 + \delta)^{-\alpha/(1 - \alpha)} \cdot \left[\delta + s \cdot (r - \delta)\right]^{-1} \cdot e^{u/(1 - \alpha)}.$$

Denote

$$H_0 = -\left[\frac{\alpha}{(1 - \alpha)}\right] \cdot \ln (1 + \delta)$$

$$H_1(s) = -\ln \left[\delta + s (r - \delta)\right] \cdot \frac{dH_1}{ds} > 0$$

$$H_2(\Psi) = \ln \left[(\alpha R)^{\alpha/(1 - \alpha)} - (\alpha R)^{1/(1 - \alpha)}\right] \cdot \frac{dH_2}{d\Psi} < 0.$$

Note that $H_1(0) = -\ln \delta$, and $H_2(0) = \ln \left[\alpha^{\alpha/(1 - \alpha)} - \alpha^{1/(1 - \alpha)}\right]$.

Inspection of equations A-12 and A-13 shows that the (logarithmic) price equation can be written in general as

$$\ln P = H_0 + H_1(s) + H_2(\Psi) + \frac{\mu}{(1 - \alpha)}.$$
References


Service Sector Protection: Considerations for Developing Countries

Brian Hindley

The inclusion of services in the Uruguay Round of multilateral trade negotiations has focused attention on the protection of domestic service suppliers against competition from foreign suppliers. Issues arising from these negotiations, however, may obscure another and more important issue: the case for unilateral liberalization. This article first surveys methods of protection in the service sector, and then examines the likely cost of protection. Particular attention is given to developing countries. What evidence there is suggests that the costs of protection may be high. The article also discusses economic principles that could guide a review of policy toward international transactions in the service sector. Quantitative restrictions or bans on foreign service suppliers—whether they wish to supply through trade or establishment—cannot easily be defended in economic terms, and provide an obvious first target.

Few governments of developing countries have welcomed the proposal that services should be the subject of a negotiation within the framework of the General Agreement on Tariffs and Trade (GATT). The compromise at Punta del Este, by which services were included as a topic for the Uruguay Round of multilateral trade negotiations, should not conceal the underlying negative response—ranging from indifference to hostility—of many developing countries. (Bhagwati 1987 provides an excellent discussion of this aspect of the Punta del Este meetings.)

Several arguments are advanced in defense of that negative response. Liberalization is seen as leading to an increase in imports of services without any compensatory improvement elsewhere in the balance of payments. Hence, balance of payments difficulties are cited as a reason for rejecting liberalization. In addition, doubts are often expressed that domestic service industries can survive foreign competition, and the infant industry argument for protection is frequently invoked. These arguments, of course, are a familiar defense of protection by developing (and other) countries—if they have novelty, it lies in their application to services.

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Other arguments are more overtly political. Thus, for example, liberalization of service transactions is often treated as a threat to local culture and even to national sovereignty. National security is cited as a reason for not liberalizing some services.

The complex of motivations and attitudes implied by the range of these arguments against liberalization suggests that the Uruguay Round negotiations on services will be difficult, at least to the extent that an attempt is made to involve a large number of developing countries. There is a clear possibility that even arduous negotiations will produce few substantive rules which will be generally acceptable to GATT members. Of course, nothing in the GATT compels a contracting party to accept any new agreement on services. A plausible prognosis is that many developing countries will not accept the code on trade in services that is expected to emerge from the Uruguay Round, or that even if they accept an "umbrella" code, few will accept its application to particular service industries.

Issues arising from the Uruguay Round, and attitudes toward the negotiations, however, should be very clearly distinguished from the issue of what policies governments pursue with respect to the service sector. The GATT negotiations are directed toward the production of an enforceable multilateral agreement on controlling government interventions in international service transactions. There are substantial difficulties in the way of arriving at such an agreement (Hindley 1987a), and there may be good reasons for developing countries to avoid entanglement in those difficulties.

A too single-minded focus on the negotiation issues, however, raises the risk that another question, one that is more important for most developing countries, will slip out of view. That is the question of the economic case for unilateral liberalization. The recent prominence of services in discussions of international economic policy raises several questions for the governments of developing countries, in particular whether a reduction in protection for domestic service suppliers against foreign competition will further the economic interests of the country. Whatever policy steps are contemplated, this question needs to be faced.

Protection against foreign sources of supply is likely to increase the price or reduce the quality of the services available in the protected market. When the purchaser of a service is its final user, this gives rise to losses of a type that are familiar from analysis of the protection of goods. Many services, however, are not for final use but are inputs into production of other goods and services.¹

The taxation of inputs into import-competing or exportable outputs raises complex problems for an assessment of final effects. A naive analysis of the balance of payments consequences of a relaxation of restrictions on imported inputs, for example, is likely to be highly misleading. Increases in the price of

¹ Evidence from input-output tables for Malaysia and the Philippines suggests that somewhat more than half of all services are for final demand and somewhat less than half for use as intermediate inputs (Sieh Lee 1984, p. 5; Arroyo 1984, p. 14).
inputs brought about by protection will in many cases translate into a tax on the production of exportable and import-competitive goods and services. The effect on the balance of payments is uncertain and, in any case, does not provide the basis for an assessment of the benefit—or otherwise—to the economy as a whole.

Governments are often aware of the dangers of protection of tangible inputs into production processes. Protection of service inputs raises similar problems and may be even more costly. Material output at the end of a production line or in a field does not in itself have much value. All the activities involved in techniques of production, design, financial arrangements and risk sharing, communications, transport, and marketing are services. Unreliable transportation, poor communications, poor product or production design, or inadequate financial or legal advice can diminish or destroy otherwise favorable prospects for meeting domestic or export demand.

Section I discusses the means by which service industries are protected. Section II takes up the question of the costs that might arise from service sector protection. Section III deals with questions of public policy.

I. MEANS OF PROTECTION

Defining Protection

The first problem that arises in discussing protection in the service sector is how to define what actions constitute protection. Services and goods are not equivalent in this respect. There are three interrelated differences between them which are relevant to policy: (1) Because of the “invisible” properties of services, imports of many services typically cannot be controlled by tariffs or by some forms of import quotas; instead, imports of services are impeded by means analogous to nontariff barriers (other than quotas) or “gray area measures” in trade in goods. (2) The efficient delivery of many services requires the producer of the service to have a presence in the buyer’s market, so that international service transactions often entail foreign investment. (3) Service industries are frequently subject to regulation of a type and intensity that are unusual in industries producing goods.

That protection in the service sector is almost entirely by means of nontariff measures raises serious problems for international negotiations on liberalizing services. In part, the problem lies in obtaining agreement between governments (some of which do not wish to abandon practices that others regard as nontariff measures) on what constitutes a nontariff barrier to trade and on what action is appropriate to deal with such barriers. There are also problems of identification and policing. Tariffs and many forms of import quotas cannot be concealed from trading partners, but some nontariff barriers are difficult to identify and quantify. The GATT process has been markedly less successful in dealing with these forms of barriers to trade in goods than it has been in reducing tariffs and quotas.
For a discussion of unilateral liberalization, however, the difference in the means of protecting goods industries and services industries is less important. A government contemplating unilateral liberalization does not have to agree with any other government on what constitutes a nontariff barrier or on what action to take about it. And the identification and policing of nontariff barriers are likely to be very much easier for the government of the country with imports which are affected than for foreign traders or foreign governments (though of course conflicts of analysis and prescription can arise between departments and ministries within a government). In the context of this article, therefore, this difference between the protection of goods and the protection of services is not central.

Imports of services, open to impediment by nontariff barriers, arise from international trade in services. International trade in services can be defined, analogously with trade in goods, as the sale of a service by a producer located in one country to a user located in another country without either buyer or seller changing location. For many services, however, such trade is not technically feasible (for example, surgery or viewing pyramids) or is not currently feasible on a large scale (for example retailing). Hence, the sale of such services requires some proximity of the provider and receiver, and in an international context, this implies that at least one of them must change location for a transaction to go forward. This does not necessarily require the presence of the producer of the service in the market of the buyer (Sampson and Snape 1985), but that is what it very often means in practice. Even where trade in services is technically feasible, it is often more efficient to supply the service through local establishment than through trade. Hence, the efficient delivery of many services requires establishment of some form in the vicinity of potential buyers. Many of the most effective barriers to international transactions in the service sector are restrictions on establishment.

Inward investment, of course, is a sensitive subject in many developing countries. The fact that liberalization of international service transactions would call for such investment goes some way to explain the widespread hostility among developing countries to liberalization.

The frequency and type of regulation also differentiate protection in the services sector from protection of industries producing goods. Regulation of service industries is widely regarded as a justified measure of public policy and as essential to the efficient supply of the service. Whatever the merits of these positions, however, the powers of regulators clearly can be used to create barriers.
barriers to international transactions in a service. In practice, nevertheless, it is sometimes difficult to identify where legitimate regulation ends and protection against foreign competition begins.

This problem is not unique to trade in services. Health and safety regulations play an analogous role in impeding trade in goods. In goods trade, however, the object of regulation is very often the product itself, rather than the producer. In service industries, where products are less standardized, producers rather than products are usually the object of regulation. Hence, regulatory authorities in service industries typically are able to control the entry of producers into the industry and also to control the way in which they conduct their business once in it.

An important new element is added to the problem of regulation when regulators have substantial discretionary power to control entry into an industry and the conduct of producers. Such power opens the possibility of a regime that is not restrictive de jure but that is highly restrictive de facto. Regulations themselves may be worded so as to place domestic and foreign suppliers on an equal footing. Their administration, however, may be less unbiased.

The "capture" theory of regulation assumes that members of the regulated industry often succeed in ensuring that regulators' powers are used in ways that will be of benefit to themselves (Stigler 1971). In this event, regulatory powers that are ostensibly granted for the protection of domestic buyers of a service will instead be used to protect domestic suppliers of the service—in part, at least, against competition from foreign suppliers.

National regulatory systems, by their mere existence, create a major dilemma for efforts to negotiate liberalization of international trade in services. The problem is that differences in regulatory standards are likely to translate into a competitive advantage for suppliers subject to one regulatory regime rather than another. Thus, for example, banks or insurance companies subject to high reserve requirements are likely to object to competition with bankers or insurers from a regulatory regime that requires lower reserves. (Hindley 1987b develops this notion more fully in the context of the European Community's difficulties in liberalizing trade in services.)

As with nontariff barriers, however, a government contemplating unilateral liberalization has a much more tractable problem. The question facing it is whether the structure of its own regulations, and the way in which they are administered, serves any genuine national interest that could not be better served by other means.

Although there is now a variety of sources from which examples of these forms of protection in the service sector can be drawn, there is little or no

3. A principal source of material on restrictions in developing countries is the inventory compiled by the U.S. Trade Representative of complaints by U.S. service suppliers against restrictions applied to them in foreign markets. In addition, five of the national studies submitted to the GATT provide information on obstacles encountered by their suppliers in overseas markets (those of Canada, Denmark, Germany, the Netherlands, and the United States). Finally, the Organisation for Economic Co-
systematic information deriving from developing countries. Various U.N. Conference on Trade and Development (UNCTAD) studies refer in passing to restrictions applied in developing countries, but they neither aim for nor claim complete coverage. One consequence is that an uncritical acceptance of the contents of the available sources runs the risk of bias against developing countries—and indeed, some of the complaints about the policies of developing countries that are listed in the developed country sources border on the trivial.

Examples of Protection Measures

The aim of the following paragraphs is to convey some flavor of the range and scope of protectionist activity in the service sector. For that purpose, it is not necessary to restrict the discussion to developing countries, and where it seems appropriate, examples are also drawn from developed countries.

With respect to barriers to imports, some means of protection are general, applying to a broad spectrum of industries. An obvious example is foreign exchange control. Exchange controls can be administered to serve as a blanket prohibition on the import of services from abroad. Other methods, however, are specific to particular industries.

A good example of a tradable service is cargo insurance. However, there is frequently official insistence that imports be insured domestically—and sometimes that exports be insured domestically. Sometimes both imports and exports must be insured in the domestic market (for example, in Bangladesh, Burundi, Cameroon, Cuba, Dominican Republic, Italy, Malta, Mexico, Rwanda, Senegal, and Tanzania). What happens in (or to) trade between countries both of which insist upon domestic insurance for exports and imports is something that I have not yet discovered. Presumably the hapless traders must insure in both markets.

Trade in other forms of insurance is in principle possible but is impeded. The purchaser of a policy from a nonadmitted insurer is subject to fines in some countries. Insurers and agents who sell insurance policies without being admitted to the market are sometimes subject to fines and sometimes to imprisonment (for example, in France, for a second offense; Philippines; Singapore; Switzerland; Thailand; and Turkey). In a number of countries, the purchase of insurance from foreign-based companies does not qualify for tax concessions that are available on policies issued by domestic insurers: such a policy is similar to an import tariff, the rate of which varies with the economic circumstances of the taxpayer.

Insurance trade, however, can take place at two levels. Direct insurance transactions entail sales from the insurer to an agent or directly to the final purchaser of the insurance. Reinsurance, however, involves transactions be-

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OECD has conducted studies of barriers in particular sectors (banking, insurance, construction services, air transport, shipping, and telecommunications services) in OECD countries.
between insurers, with the reinsurer accepting all or part of the risk insured by the direct insurer. The international reinsurance business is subject to some restrictions, mainly in the form of rules governing the amount of reinsurance that local insurers must cede to local reinsurers—typically a single state-owned firm. Kenya and Turkey, for example, call for the cession of 25 percent; the Philippines permits no more than 20 percent reinsurance with foreign companies; and Brazil requires all reinsurance to be with the state corporation. Apart from the case of domestic reinsurers themselves reinsuring abroad, these policies are analogous to the domestic content plans common in the motor vehicle industries in many countries.

Nevertheless, international reinsurance is still relatively unrestricted. This opens the possibility that protection imposes lower costs than would otherwise be the case, because it implies the possibility that local insurers in some degree act as agents of the international reinsurers, who in turn are operating in an extremely competitive and open global market. By the same token, however, it also opens to question the rationale of the very heavy protection given to local insurers. (Hindley 1982 discusses protection of the insurance industry in developing countries in more detail.)

The supply of other tradable services is not structured in the same way as is insurance, and protection against imports accordingly calls for different means. A striking example is that of air passenger transport. International carriers are typically excluded from domestic carriage. In international air transport, bilateral agreements between governments regulate routes, capacity, and prices and in many cases have the effect not just of protecting against imports but also of eliminating net trade. An English person might be transported to Frankfurt by Lufthansa, and British Airways might carry a German to London. Nevertheless, the effect of the bilateral agreements between the British and German governments is that other airlines cannot enter major routes and that roughly the same number of Germans will fly by British Airways as Britons will fly with Lufthansa. Furthermore, many bilateral agreements call for revenue sharing, so that if one of the two airlines on a route carries more passengers than the other, it makes little difference to the financial outcome for either airline.

That such a tight system of protection needs supplements is perhaps surprising. Nevertheless, a number of other devices are recorded. These include limitations on access to reservation systems, discriminatory user charges at airports, preferential ground handling facilities for domestic airlines, and the allocation to national airlines of superior landing and take-off slots and to foreign carriers of inferior airport space—or even inferior airports.

International maritime transport has traditionally been largely free of official restrictions. A bilateral system similar to that in international aviation has made inroads through the UNCTAD Liner Code, and the code is administered by developing countries so that it is more restrictive in fact than on paper. The code division of freight between country A and country B is 40:40:20—40 percent in A ships, 40 percent in B ships, and 20 percent reserved for cross-
trade. In many trades, however, the de facto division is reported to be 50:50:0. (As with air transport, cabotage—shipping between domestic ports—has commonly been reserved for domestic carriers.)

Also noted as a large impediment is the cargo reservation system, whereby government regulation reserves a certain amount of cargo for national carriers. The U.S. Trade Representative inventory reports that eighteen countries operate such schemes. Fifteen of these are developing countries.

A service that is tradable in the sense that it does not require local establishment is construction engineering. (Indeed, requirements of establishment in the country in which a contract is to be carried out are reported as barriers to international transactions in this industry.) A very frequent complaint of suppliers in this industry relates to public procurement practices, which also appear as complaints in other industries. The importance of governments and public authorities in large construction works, however, means that a biased public procurement policy is more important in this industry than in most service industries. Another widespread complaint relates to subsidization of competing bidders. Very often, however, the subsidization referred to is not by the government of the country offering the contract but by other foreign governments which are backing the bid for a contract of one of their national firms.

Like restrictions affecting trade, some of the restrictions affecting establishment are general. Limits on the repatriation of profits, for example, are likely to deter investment in any sector, and limits or barriers on the deployment of personnel or on transborder data flows will affect the operations of firms in many sectors. Other restrictions, however, apply to specific industries.

Two broad types of restrictions affect establishment. Restrictions of the first type either place restrictive conditions upon initial establishment or simply ban it (de jure or de facto). The second type of impediment limits the activities of establishments of foreign producers of services: locally established foreign producers may not be able to enter certain lines of business, for example, or service particular classes of customers, or open new branches.

The financial services sector is heavily affected by restrictions on establishment. Banking services can be traded across borders in some small degree—many persons and companies resident in one country maintain a bank account in another country, for example, although foreign exchange restrictions seek to prevent this for the residents of many countries. To offer a full range of banking services, however, and hence to be able to compete in a domestic market, a bank must, at present, have a presence in the other country. Many countries impede establishment by foreign-based banks. Some completely prohibit establishment. Others will allow only a representative office, which cannot engage in any form of banking business. Restrictions on the opening of branches and on the acquisition of domestic banks through takeover are also common.

Even where establishment is allowed, foreign-owned banks are often treated differently from domestically owned banks. Foreign-owned banks are often subject to discriminatory reserve requirements, to higher requirements on cap-
ital-asset ratios, or to higher taxation than domestic banks. A frequent complaint of foreign-based banks is that they do not have access to the rediscount facilities of the host central bank or to subsidized lines of credit, such as export guarantees. They are restricted in the range of services they can offer and in the assets they can acquire. (Walter 1987 supplies a detailed analysis of the restrictions placed on foreign banks.)

A similar picture emerges for insurance. Some governments prohibit access by foreign insurers. Others require local incorporation. Foreign-owned insurers are often subject to discriminatory capital and deposit requirements and are also restricted in the assets they can acquire (Carter and Dickinson 1987).

Other service industries in which establishment problems are reported as a major barrier to entry are advertising and accountancy. Indeed, establishment is a general problem for international transactions in professional services.

The validity of administrative decisions by regulatory authorities, or of complaints about them, are difficult to assess except on the basis of detailed case-by-case study. It is a fact, however, that a variety of service suppliers complain of unfair treatment by regulatory authorities. This is true, for example, of banks, insurers, and advertising agencies.

II. THE COST OF PROTECTION

Available data do not permit a reliable numerical estimate of the cost of protecting domestic service industries against foreign competition for any economy. In this section, I discuss some of the facts that are relevant to a judgment of whether the cost is likely to be "large" or "small."

Issues Affecting the Cost of Protection

The first and most often cited fact is that services bulk very large in national incomes. The proportion of national income assigned to services obviously depends on what is included as a service. By World Bank definitions, production of services accounted in 1983 for a third of the gross domestic product (GDP) of low-income developing countries and half of the GDP of middle-income countries. By itself, this observation suggests that policies that deny domestic users of a wide range of services access to the price-quality combinations that are available internationally may cause substantial economic damage.

The services that are of concern in the present context of protective policies, however, are those which entail some form of international transaction. In many services, the possibility of international trade is very limited, if it exists at all, so that the distinction between trade and investment is again relevant. The quality of a retailing or local transportation system might be improved as a result of the involvement of foreigners in the supply of the services through foreign investment or franchising or as a result of the use of foreign consultants. There is little possibility of achieving this through direct trade in the services themselves.
From the standpoint of assessing the potential costs of protection in the service sector, however, the distinction between delivery through trade and delivery through local establishment may not be important. Although the distinction is significant from a political point of view, it is less significant from a strictly economic point of view. From that standpoint, the central question is whether price can be reduced or quality improved through the involvement of foreign producers. The exact mode of their involvement seems less important.

The argument regarding establishment can also be applied to the temporary relocation of labor. For unskilled labor, this applies much more to exports from developing countries than to imports. Thus developed countries suffer economic losses from refusing to allow developing countries to supply construction works, which, because they cannot be built in one location and shipped to another (for example, roads), would require a temporary relocation of labor from developing countries. (On this, see Bhagwati 1987.)

There is, however, an economic reason for distinguishing trade and the movement of factors of production in the context of a discussion of the costs of protection. Where a service can be either imported or produced by locally established foreign firms, the output of the latter may be closer to local price and quality than services imported from abroad. Local establishments are subject to local regulatory authorities, for example, who may themselves be a cause of inefficiency in domestic production. Moreover, locally established service producers are likely to use at least some local factors of production, and this may limit the extent of potential improvement. (It may also allow even lower costs, of course; from the standpoint of economic efficiency, there is a case for allowing producers—foreign or domestic—to choose their own methods and locations of production.) Nevertheless, where for either technical or legal reasons foreign producers can be involved only through establishment or some other nontariff means, they may not be able to transfer fully to a foreign market any greater efficiency they may have in their home market.4

Any attempt to estimate the cost of protection in the service sector requires a comparison of some estimate of the price and quality of a service within the protected economy with an estimate of the price and quality that would be available to its residents in the absence of protection. One reason for the lack of relevant figures lies in the nature of the nontariff barriers that protect service industries. Tariffs provide a basis for making a direct estimate of the difference

4. A basis for a second possible argument is supplied by Brecher and Diaz-Alejandro (1977). In the context of a 2x2 model, they provide circumstances which must lead to an overall loss for a host country importing capital-intensive goods which it protects by tariff. A limited inflow of capital expands domestic production of the capital-intensive good, so substituting expensive domestic output for imports on which tariffs would have been paid. The host country loses tariff revenue, and the foreign investors gain the higher profits brought about by protection of the capital-intensive good. The argument might have a parallel in the service sector when limited foreign investment is permitted in an oligopolistic industry earning high profits. In both cases, however, the possibility of loss depends on the restriction on foreign investment. Foreign investment in sufficient quantities to press returns in the sector to a competitive level would not create an economic loss.
between world and domestic prices attributable to the tariff. Most nontariff
barriers do not, and consequently their use in either goods industries or service
industries presents difficulties for estimating the cost of protection.

Examples of the Cost of Protection

A starting point for an estimate of the cost of protecting services would be
data on the price of a service in a country where it is protected and in one
where it is not. True prices, however, are often difficult to obtain, and even
when they are available, prices by themselves do not provide very useful infor-
mation. The quality of a service must also be considered, and this is often
difficult to measure objectively. Were a service from two countries simultane-
ously and freely traded in a common market, the price differential (or the lack
of one) would shed some light on the issue; but that is not a common state of
affairs.

For some services, prices are available and quality can reasonably be assumed
to be constant or corrections can be made for the difference in quality. Trans-
port services are one area in which price comparisons have been made. The
results suggest that the effects of protection are substantial.

U.S. shipments of Public Law 480 agricultural aid provide a striking example
of the cost problem. Until early 1986, U.S. law required at least 50 percent of
such shipments to be carried in U.S. flag ships (in 1986, the requirement was
raised to 75 percent). The remaining shipments were open to competition by
ships flying other flags. Hence, there are two prices for such shipments: one
for U.S. ships and another for other ships, which presumably provides some
approximation of a world price.

One recent study (White 1986), after correcting for type and size of cargo
and distance shipped, concluded that "as a conservative estimate, we can say
that the U.S. flag rates for the protected shipments were about double those of
foreign flag carriers." This conclusion is consistent with those of previous
studies of the differential (U.S. General Accounting Office 1982, 1984; Binkley
and Harrer 1981).

Studies of another protected U.S. maritime market show even greater differ-
entials. Data on the shipment of petroleum suggest that the price per ton-mile
of U.S. tankers operating in the protected environment of shipments for the
Strategic Petroleum Reserve is about four times the international rate (Morgan

Civil aviation provides other examples of the effect of protection and regu-
lation. Twenty years ago, observers of air fares in the United States found fares
on intrastate routes, which were not subject to federal regulation, to be very

5. U.S. policy toward maritime transport provides an interesting example of a service affecting
exports of a good. The fact that lumber shipped from Seattle must use U.S. bottoms—because of U.S.
cabotage law—whereas lumber shipped from Vancouver can be shipped at international rates apparently
gives Canadian lumber a competitive advantage in the southeastern part of the United States.
much lower than fares over similar distances on federally regulated interstate routes. Following deregulation in the United States, simple comparisons of fares on routes within the United States, or on international routes to the United States, with fares within heavily regulated areas such as Europe yield numerous cases in which the European fares over similar distances are two or three times higher than U.S. fares. More detailed research suggests that these fare differentials may in some degree be explicable in terms of higher costs of operation in Europe. It seems that they cannot be made to vanish by this means, however (Civil Aviation Authority 1983).

Airline costs and revenues appear to be related to regions. The International Civil Aviation Organization (1983) has commented on this as follows:

The differing revenue/cost ratios achieved by European airlines appear to be determined by the competitive situation on each route group in 1982. On routes between Europe and Asia-Pacific the competition was such that neither the European nor the Asia-Pacific airlines achieved profitability. On Europe-Middle East routes the European airlines could earn a profit because they were able to maintain a higher average revenue yield than the Middle East airlines. On the Europe-Africa route group, the European airlines were also profitable because they had much lower cost levels than the African airlines.

An interesting aspect of the deregulation of airlines in the United States is the apparent failure of advocates of regulation to anticipate the extent to which deregulation would exert downward pressure on wages in the industry. That is to say, they had not appreciated the extent to which labor in the industry had captured the rents created by regulation.

Regulation may have produced similar effects elsewhere. European airlines frequently object to comparisons of their fares with those in the United States, saying that their costs of operation are higher. But as Pryke (1987) comments, “The main reason for this disparity in costs was that the maintenance costs of West European airlines were 27 percent greater, their expenditure on ticketing and sales was 52 percent higher and their general administration costs were 112 percent more than for American airlines” (p. 28). Pryke’s discussion of payments to staff of European airlines also suggests the possibility that wages in the industry are inflated.

The possible effects of protection on costs and wages in the protected industry raises another issue: the problem of assessing the consequences of protection or liberalization in the service sector. For example, from currently available data, it seems clear that airlines based in the United States have a comparative advantage over airlines based in Western Europe, and it is easy to arrive at the conclusion that open and unsubsidized competition between the two groups would result in U.S. airlines dominating the field. But to reach this conclusion is to assume that such open and unsubsidized competition would not affect wages and effective labor inputs in Europe. This is a dubious proposition, as
the analysis and figures cited above suggest. The extent of U.S. comparative advantage is therefore almost certainly overestimated by any exercise based on current statistics for the industry—and perhaps there is no U.S. comparative advantage that would survive competition.

Protection of other service industries may raise the wages or lower the effective input of workers in the industry. If so, estimates of the chances of survival and success of industries in the face of international competition that do not take account of this fact may be much too pessimistic.

To generalize from these examples for the transport industry to service industries in general would be foolhardy. Nevertheless, it is clear that the effects of protection on the price of services can be substantial. It seems plausible that the effect of protection on the quality of service offered on the domestic market may also be substantial, especially when that market is isolated from international conditions by bans or quotas. On this basis, the cost to an economy of heavily protecting its service sector may be high.

III. APPROPRIATE PUBLIC POLICY TOWARD THE SERVICE SECTOR

Arguments for Protection

The policies of many developing (and other) countries toward the services sector invite economic losses. These losses cannot yet be quantified, but the possibility that they are substantial seems clear. Is there any economic argument—as distinct from cultural integrity or national security arguments, which are discussed later in this section—to suggest the existence of offsets to the economic losses caused by protection of service industries against foreign competition?

The infant industry argument and the need to balance external payments are often advanced in this context. As a defense of protection in the service sector, these two arguments have one major strength and one major weakness.

The strength is institutional. Article XVIII of the GATT accepts these arguments as valid grounds for protection in developing countries. The weakness is intellectual. Properly analyzed, neither position offers anything other than third or fourth best arguments for protection.

An extensive literature deals with the difficulties of constructing a case for trade protection from the infant industry argument (see Bhagwati and Ramaswami 1963; Johnson 1965), and also with the ineffectiveness in many circumstances of protection as a response to balance of payments deficits (Johnson 1961; McKinnon 1981). These general arguments have been applied to services (Hindley 1982; Hindley and Smith 1984), and they seem even less applicable to service industries than to goods industries. It is unnecessary to cover the ground anew here: the economic arguments for protection of the domestic service suppliers against foreign suppliers are not compelling.

Arguments based on national sovereignty and security, however, cannot be disposed of so easily, at least by means of economic analysis. Economic analysis
may have something to say about appropriate means of achieving policy objectives, but it has little that is useful to say about the ultimate objectives themselves.

Moreover, the residents of developed countries are not in a strong position to rebut arguments from developing countries based on concern with local sovereignty or culture. The United States, for example, insists for a variety of services that the companies supplying them in the United States be owned by U.S. nationals (for example, television stations and airlines). Developing countries which maintain that their communications, banks or insurance companies, or entertainment industry should be controlled by their nationals are therefore not without precedents to cite.

Even after all of that is conceded, however, there is still scope for economic examination of policies. One ground for this is cost. A national insurance industry may be thought important to national welfare. Translation of that judgment into support of such an industry, however, is unlikely to be independent of the true cost of that policy. A second ground, related to the first, is provided by the means employed to achieve the stated ends. To accept that it is a valid national goal to have locally owned suppliers of insurance is very far from accepting that any policy that impedes foreign suppliers is therefore justified.

**Economic Ranking of the Instruments of Protection**

From the standpoint of international trade theory, the issue is the ranking of instruments of protection. It is a standard proposition of international trade theory that if the object of policy is to sustain the output of an import-competing industry at a higher level than would otherwise exist, then from the point of view of the importing country, a subsidy to the output of the industry is superior to tariffs as a means of achieving that end (Corden 1957)\(^6\) (except in the unlikely circumstance that the least-cost way of raising government revenue is an import tariff on the good in question).

The assessment of quantitative restrictions from this point of view is more complex because there are so many ways of administering them. Two key variables determining their social cost, however, are the destination of the rents associated with the quota rights, and the state of competition in the affected industry. At one extreme, in which domestic residents receive quota rents and there is perfect competition in all affected markets, it can be shown that tariffs

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\(^6\) The same theorem states that the most efficient means is not independent of its objective—in particular, if the objective is to restrict imports, then a tariff is superior to a subsidy. In some service industries, the goal might indeed be to restrict imports—for example, where foreign films or television programs are seen as a threat to local culture—and the ranking would then be reversed. Moreover, to rank a subsidy to output as superior to a tariff assumes that a country is unable to affect the terms of trade—or at least that the level of tariff protection is less than the optimal tariff. For most developing countries, if not all, this appears to be a plausible assumption with respect to services.
and quotas are equivalent in a static, efficiency sense. But if the quota rents go to foreigners (as may be the case with voluntary export restraints), a quota is a very much more expensive means of expanding output in the import-competing industry than a tariff, from a national point of view.

Moreover, the effects of quotas and tariffs can be quite different from one another in the presence of imperfect competition (Bhagwati 1969). Measures affecting the price of imports, such as tariffs on goods, create problems of monopoly only when the tariff eliminates imports. Even when there is only one or a few domestic producers, imports can be substituted for home output at the world price plus the tariff. Quantitative restrictions on imports of goods, however, prevent such substitution. When there is a single domestic producer, for example, it is easily shown that a policy imposing the free trade level of imports as a quota will induce the domestic producer to reduce his output.

Quotas on imports therefore can be an extremely expensive means of expanding the output of an import-competing industry and may actually cause it to contract. Quotas are most costly, and their effects on the output of the protected industry most dubious, when they shelter an industry consisting of one or a few firms or when the quota rents go to foreigners.

This kind of analysis yields a ranking, in terms of economic cost, of policies to expand the output of an import-competing industry that produces a good. Where \( X > Y \) denotes that \( X \) is less costly than \( Y \), the ranking is

\[
\text{subsidy to output} > \text{tariff} \geq \text{quota},
\]

where, as explained, equality between tariffs and quotas demands quite restrictive conditions, and the costs of a quota may be very much greater than those of a tariff.

The relevant question is whether this kind of analysis can be applied to international transactions in services. It has been shown that the measures by which domestic producers of services are protected are often different from those adopted in goods industries and that the details of the measures may vary according to the particular service. Nevertheless, those means can be separated into two broad types. The first type of protective measure imposes a cost disadvantage on foreign producers (or provides a cost advantage to domestic producers). The second type imposes quantitative limits on the sales of foreign producers—a category which includes total bans on sales of any kind by foreign producers.

From an analytical point of view, the provision of a price or cost advantage to local producers without increasing the price or cost of the service provided by foreigners can be viewed as equivalent to a subsidy to local output in trade in goods. The imposition of a price or cost increase upon foreign producers can be viewed as equivalent to a tariff. The policies differ in that the latter will cause a deterioration in the price-quality-of-services combination that foreigners are able to offer in the local market, whereas the provision of a price
advantage to domestic producers retains for local buyers the option of purchasing the best price-quality combination available to them on the international market.

The result from the theory of trade in goods, that a subsidy to output is superior to a tariff as a means of expanding the output of the import-competing industry, is based precisely on the fact that the tax on buyers that is implicit in a tariff does nothing to further the objective of the policy and is therefore deadweight loss. That is also true in the present case of services. From the standpoint of economic efficiency, therefore, a policy of providing a cost advantage to domestic producers is superior to one of placing a cost disadvantage on foreign producers or suppliers.

The costs associated with import quotas when the quota rents go to foreigners or when the protected industry consists of one or a few firms also survive the transition to services. The enhanced profits of foreign firms that have access to the quantity-protected market now play the role of quota rents for foreigners. A plausible conjecture about the hesitation of European service industries to support the U.S. initiative on services in the GATT is that some important members of those industries have grandfathered subsidiaries in the heavily protected markets of their nations' former colonies, and so any thoroughgoing liberalization would threaten the profits of these subsidiaries.

Analysis of quota protection of monopolistic industries also finds application to service industries. Some service industries in developing countries contain few firms. Moreover, the potential for oligopolistic behavior is reinforced by the presence of regulators with strong powers, which the local producers may have “captured.” Where such an industry is protected by a quantitative restriction placed on foreign producers, there is an incentive for monopolistic exploitation of domestic buyers by domestic sellers of the service. The incentives for foreigners permitted in such a market will, of course, be affected as well. Because the quantitative restriction will not permit them to increase sales, the price or quality of their service is also likely to deteriorate. Where this is reflected in enhanced profits, the outcome is similar to the worst yielded by a quota in the theoretical analysis of goods trade.

When due modification is made for the nature of the policy instruments that can be applied to the service sector, it appears that the ordering of policies for the support of import-competing industries applies to services as well as to goods. As a matter of practical policy, the prevalence of quantitative restrictions in the service sector, and the possibility and probability that the harm they cause may be high, suggests a clear first step for reviews of policy toward international transactions in the service sector. That step is to ensure that measures limiting the quantity of sales of services by foreigners are necessary for the achievement of policy goals. Where such measures can be replaced by others that affect the relative costs of foreign and domestic producers, there is a very strong presumption that the replacement will lead to economic gains. The argument presented above can be summarized by discussing the
implications of this analysis for the various protection measures described in section II.

Restrictions on Imports. There does not appear to be an economic case for restricting imports of services. If the desire is to maintain the import-competing industry at a greater scale than it would have in the absence of any policy, the least-cost way to achieve that end is likely to be by subsidizing domestic producers of the services.

It follows that many of the practices complained of by U.S. service suppliers which amount to subsidies to domestic producers of a service are defensible in the sense that they may impose a lesser cost on the country adopting them than alternative policies aimed at the same objective. Of course, the ends to which a policy is directed are very much open to debate—even though economic theory does not have any very useful contribution to make to that particular debate.

Any proposal for subsidies runs into the objection that it calls for disbursement of governmental revenue rather than its collection, which a policy of taxing foreign suppliers would achieve. The objection is regarded as very much more compelling by finance ministries than it is by many economists, and it therefore must be supposed that some finance ministries will look more favorably upon a policy of supporting import-competing industries by taxing foreign suppliers and domestic consumers than on one of directly subsidizing domestic producers.

If the judgment of finance ministries is accepted, along with the judgment that it is socially worthwhile to support a domestic industry, then another set of policies complained of by service suppliers from developed countries—discriminatory taxes on their products—may be justified. The argument from raising revenue, however, now cuts in another direction. There can be very little economic sense in policies that reduce the competitive ability of foreign suppliers but that do not raise revenue. Such policies will indeed help local suppliers, but apart from such nebulous factors as pride in local ownership, they are the only ones who will gain from them. There is a strong economic case for substituting a tax on foreign suppliers for such policies.

Bans or quantitative restrictions on foreign suppliers are impossible to defend in terms of economic efficiency, and they raise no revenue. Given the availability of alternative and superior policies to assist the domestic industry, a ban on foreign suppliers requires strong justification. The terms in which such a justification could be formulated are not evident for most service industries.

Impediments to Establishment. Establishment may touch politically sensitive nerves, but from an economic standpoint it is simply an alternative to imports as a means of delivering a service. The comments made above on imports of

7. It does not seem relevant to economists for two reasons. First, subsidies to one industry can always be increased by increasing taxes on other industries, although that clearly may not make good political sense. Second, taxes on foreign suppliers will allow domestic producers to raise their prices and thus collect a "tax" directly from purchasers of their product. The fact that the "tax" does not go through the finance ministry does not seem very relevant to a judgment on overall social welfare.
services also apply to services delivered through establishment. If the aim of supporting the import-competing industry is accepted, then the best means of supplying that support is by the payment of subsidies to that industry; the second best means of supporting it is by taxing foreign suppliers, whether they are locally established or provide their services through trade. Measures that impede the competitive efficiency of foreign suppliers without raising revenue are unlikely to constitute good policy. Bans and quantitative restrictions cannot be defended, either on grounds of economic efficiency or of raising revenue.

Regulation. Regulatory powers are often justified as necessary to protect domestic buyers of a service from lazy or rapacious sellers of the service. Both theory and observation suggest that such powers sometimes are used instead to protect domestic sellers of a service from the impact of competition from abroad—and therefore foster inefficiency. Where this has occurred, governments must decide on whose behalf they want to use their regulatory powers—in the interests of users of the service or those of producers.

There does not appear to be any good economic case for using regulatory powers on behalf of suppliers. Support of the domestic industry would be better achieved by the measures suggested above. The protection of buyers is a legitimate function of regulation, but if the powers granted for the exercise of that function are instead used on behalf of local producers—and so against the buyers of the service—it might be better to do away with the regulatory authority and permit buyers to fend for themselves.

IV. Concluding Comments

As a practical matter, it must be said that the resistance of the governments of developing and other countries to liberalization in the service sector is in some degree a natural consequence of the prior lack of international rules governing protection in that sector. Service industries in some economies are very heavily protected. Some members of such industries very understandably prefer the status quo, and they are likely to possess very substantial blocking power. It would be foolish to suppose that they will easily be shifted.

The arguments for and against protecting the service sector in developing countries have been discussed. The arguments for protection are much less solid than the structures of protection that have been built upon them. The restrictive policies pursued by some governments are likely to impose substantial costs upon members of their economies.

To have that conclusion backed by more research on service sector protection in developing countries and by practical experience with liberalizing services in developing countries would be valuable. Enough is already known, however, to strongly support the proposition that for most developing countries, reviews of policy toward international transactions in the service sector will yield a number of possibilities for economic gain, and that for some developing countries, these gains will be large.
REFERENCES


The Korean Construction Industry
as an Exporter of Services

Soojong Kim

This article analyzes the experience of the overseas construction industry in the Republic of Korea in the 1970s and 1980s, emphasizing the factors that made Korean construction firms competitive in the world market. Korean construction exports to the Middle East and the roles of Korean workers, entrepreneurs, and the government are examined. Recent erosion of Korea's competitiveness in labor-intensive construction in the Middle East is discussed in relation to the need to develop expertise in design and engineering projects and to increase access to construction markets in developed countries through bilateral or multilateral trade negotiations. The importance of the issue of labor movement in the current Uruguay Round negotiations in services trade is emphasized.

The oil-exporting countries of the Middle East have been the principal markets for the exports of construction and engineering services of developed countries since the mid-1970s. The revenues from oil exports and the ambitious development plans of the oil-exporting countries made the Middle East a new competing ground for top international construction firms.

Korean construction firms, with little experience in foreign markets, entered the Middle East market in 1973, and by 1980 the Republic of Korea had become the second largest exporter of construction services in the world in terms of new orders received. In 1981 new foreign orders received by Korean firms reached a peak of $13,681 million, over 92 percent of which were from the Middle East. (All dollar amounts in the text and tables are U.S. dollars.)

The foreign exchange earned by Korean firms and Korean workers during the

1. Exports of construction services are expressed in the text and tables in terms of the value of new contracts awarded during given periods. These values are used because of the difficulty of calculating the value of construction work done during the periods or the value of services net of material costs.

The author is professor of economics at Sogang University, Seoul, Republic of Korea. An earlier version of this article was presented at the World Bank Conference on Developing Countries' Interests and International Transactions in Services, Washington, D.C., July 15 and 16, 1987. The author benefited from discussions with conference participants and is particularly grateful to Brian Hindley for many detailed comments on previous versions of this article. Three anonymous referees also provided helpful comments.

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1970s and the early 1980s contributed significantly to the Korean economy by easing the pains of the restructuring that followed the two oil shocks.

The decline in oil prices and the corresponding decline in construction expenditures of the Middle East countries since 1983 have rapidly reduced the construction orders received by Korean firms. Nevertheless, overseas construction remains Korea's most important service export. The rise (and fall) in Korean overseas construction poses interesting questions. In light of the increasing emphasis on international trade in services, this article examines the experience of the Korean construction industry in the world market, with an emphasis on the factors that made the Korean firms competitive. The article assesses the current problems and future prospects of Korean firms in overseas construction, especially the possibilities for expanding exports of Korean construction services to developed countries.

I. A Brief History of Performance

In September 1965, the Hyundai Construction Company of Korea was awarded a $5.2 million contract for highway construction in Thailand, financed by loans from the International Bank for Reconstruction and Development (IBRD). This was the first time a Korean construction firm had been awarded a contract in a foreign country. In the nine-year period from 1965 to 1973, the beginning phase of Korea's overseas construction, Korean construction firms won contracts in foreign countries totaling $423 million (see table 1). The bulk of these contracts (71 percent) was from Southeast Asian countries. By the end of 1973, Korean construction firms had contracts in twenty-six foreign countries or territories.

Korea's construction exports surged after the oil shock in 1973 and the sudden emergence of a huge construction market in the Middle East. The first Korean firm to enter the Middle East market was Samwhan Enterprise Company, which in December 1973 was awarded a $24.1 million contract to build a highway in Saudi Arabia. This opened a new frontier for Korean construction contractors, who were looking for new foreign markets after the decline of the construction market in South Vietnam in the early 1970s.

In 1974, seven Korean firms won new contracts in the Middle East totaling $89 million; in 1975, the figures rose to twenty firms and $751 million. As table 1 shows, the growth of Korea's construction exports to the Middle East was phenomenal by any standard. Just five years after the first contract, Korean firms' share of the Middle East market reached 25 percent.

2. Samwhan's effort to enter the Middle East market actually began in 1972, before the first oil shock, and the highway project was the fourth that Samwhan had bid for in Saudi Arabia. In the first two bids, Samwhan was the lowest bidder but did not win the contracts. (See Samwhan Enterprise Co. 1979, pp. 494-501.)

3. New contracts in 1978 amounted to $7,982 million, whereas the estimated total market size was
Table 1. Korean Construction Exports, 1965–86
(new contracts awarded, in millions of dollars)

<table>
<thead>
<tr>
<th>Year</th>
<th>Middle East</th>
<th>Other areas</th>
<th>Total</th>
<th>Middle East as percentage of total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1965</td>
<td>—</td>
<td>5.4</td>
<td>5.4</td>
<td>—</td>
</tr>
<tr>
<td>1966</td>
<td>—</td>
<td>5.6</td>
<td>5.6</td>
<td>—</td>
</tr>
<tr>
<td>1967</td>
<td>—</td>
<td>15.7</td>
<td>15.6</td>
<td>—</td>
</tr>
<tr>
<td>1968</td>
<td>—</td>
<td>20.6</td>
<td>20.6</td>
<td>—</td>
</tr>
<tr>
<td>1969</td>
<td>—</td>
<td>14.4</td>
<td>14.4</td>
<td>—</td>
</tr>
<tr>
<td>1970</td>
<td>—</td>
<td>48.0</td>
<td>48.0</td>
<td>—</td>
</tr>
<tr>
<td>1971</td>
<td>—</td>
<td>55.7</td>
<td>55.7</td>
<td>—</td>
</tr>
<tr>
<td>1972</td>
<td>—</td>
<td>83.2</td>
<td>83.2</td>
<td>—</td>
</tr>
<tr>
<td>1973</td>
<td>—</td>
<td>150.2</td>
<td>174.3</td>
<td>13.8</td>
</tr>
<tr>
<td>1974</td>
<td>88.8</td>
<td>171.8</td>
<td>260.6</td>
<td>34.1</td>
</tr>
<tr>
<td>1975</td>
<td>751.2</td>
<td>63.6</td>
<td>814.8</td>
<td>92.2</td>
</tr>
<tr>
<td>1976</td>
<td>2,429.1</td>
<td>72.6</td>
<td>2,501.7</td>
<td>97.1</td>
</tr>
<tr>
<td>1977</td>
<td>3,387.0</td>
<td>129.2</td>
<td>3,516.2</td>
<td>96.3</td>
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<tr>
<td>1978</td>
<td>7,982.4</td>
<td>162.6</td>
<td>8,145.0</td>
<td>98.0</td>
</tr>
<tr>
<td>1979</td>
<td>5,958.4</td>
<td>392.9</td>
<td>6,351.3</td>
<td>93.8</td>
</tr>
<tr>
<td>1980</td>
<td>7,831.0</td>
<td>423.4</td>
<td>8,259.4</td>
<td>94.8</td>
</tr>
<tr>
<td>1981</td>
<td>12,674.2</td>
<td>1,006.8</td>
<td>13,681.0</td>
<td>92.6</td>
</tr>
<tr>
<td>1982</td>
<td>11,391.8</td>
<td>1,991.6</td>
<td>13,383.4</td>
<td>85.1</td>
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<tr>
<td>1983</td>
<td>9,023.3</td>
<td>1,420.6</td>
<td>10,443.9</td>
<td>86.4</td>
</tr>
<tr>
<td>1984</td>
<td>5,910.5</td>
<td>591.9</td>
<td>6,502.4</td>
<td>90.9</td>
</tr>
<tr>
<td>1985</td>
<td>4,285.3</td>
<td>405.6</td>
<td>4,690.9</td>
<td>91.4</td>
</tr>
<tr>
<td>1986</td>
<td>1,241.6</td>
<td>997.5</td>
<td>2,239.1</td>
<td>55.5</td>
</tr>
</tbody>
</table>

—None.

Source: Republic of Korea, Ministry of Construction, Construction Exports, various issues.

Korea's construction exports reached a peak of $13,681 million in 1981 but have declined continuously since then. New contracts received in 1986 were only 16 percent of the 1981 figure. The rapid decline was due largely to the decline in construction activities in the Middle East, which constituted by far the largest foreign market for Korean construction firms, averaging 90 percent of construction exports during the 1975–86 period.

Construction exports for the major exporting countries in terms of new contracts awarded during 1981–85 are shown in table 2. The table clearly shows that Korea is the only major construction service exporter whose market share has declined steadily and substantially in recent years—from about 11 percent during 1981–83 to less than 6 percent in 1985. Although 1986 figures are not available, Korea's share is certain to be lower than that in 1985 because the value of Korea's new contracts in 1986 was less than half that in 1985.

$31,752 million. (For details of the estimation, see Overseas Construction Association of Korea 1985, pp. 12–15, 32–37.)

4. These data are from the annual surveys of the top 250 international contractors conducted by the Engineering News Record; the data for Korea differ from those in table 1, which are based on Ministry of Construction reports.
Table 2. Construction Exports of Major Exporting Countries, 1981–85
(new contracts awarded, in billions of dollars)

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>44.1 (33.9)</td>
<td>44.9 (36.5)</td>
<td>29.4 (31.4)</td>
<td>30.7 (38.1)</td>
<td>28.2 (34.6)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Korea</td>
<td>14.3 (11.0)</td>
<td>13.8 (11.2)</td>
<td>10.4 (11.1)</td>
<td>6.6 (8.2)</td>
<td>4.8 (5.8)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Japan</td>
<td>8.2 (6.3)</td>
<td>9.3 (7.6)</td>
<td>8.7 (9.3)</td>
<td>7.3 (9.1)</td>
<td>11.6 (14.3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>France</td>
<td>12.5 (9.6)</td>
<td>11.4 (9.3)</td>
<td>10.0 (10.7)</td>
<td>5.3 (6.6)</td>
<td>6.7 (8.2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fed. Rep. of Germany</td>
<td>10.0 (7.7)</td>
<td>9.5 (7.7)</td>
<td>5.4 (5.8)</td>
<td>4.8 (6.0)</td>
<td>5.4 (6.6)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Italy</td>
<td>8.2 (6.3)</td>
<td>7.8 (6.3)</td>
<td>7.2 (7.7)</td>
<td>6.8 (8.4)</td>
<td>8.7 (10.6)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>United Kingdom</td>
<td>7.9 (6.1)</td>
<td>7.5 (6.1)</td>
<td>6.4 (6.8)</td>
<td>5.6 (7.0)</td>
<td>5.6 (6.9)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Others</td>
<td>24.7 (19.0)</td>
<td>18.9 (15.3)</td>
<td>16.1 (17.2)</td>
<td>13.4 (16.6)</td>
<td>10.6 (13.0)</td>
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<td>Total</td>
<td>129.9 (100.0)</td>
<td>123.1 (100.0)</td>
<td>93.6 (100.0)</td>
<td>80.5 (100.0)</td>
<td>81.6 (100.0)</td>
<td></td>
<td></td>
<td></td>
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</table>

Note: Billion is 1,000 million. Data for Korea differ from those in table 1, which are based on Korean Ministry of Construction reports.

Source: Engineering News Record, various issues.

In the Middle East market, construction firms from developed countries have recruited local workers or temporary migrants from third countries to work on their construction projects, whereas developing countries (mostly Asian countries) have supplied labor directly to the market. Korea has been the only major exporter of construction services to bring its own construction workers to the site, an important factor in explaining the performance of Korean overseas construction.

II. Economic Effects

Foreign exchange earnings have been an important benefit of overseas construction. As shown in table 3, annual foreign exchange earnings from Korean overseas construction have come mostly from remittances from Korean workers employed abroad by Korean overseas construction firms. Profits of the Korean firms are included in the earnings, but exact amounts are not available because of the long duration of most overseas construction projects and the difficulty

5. These are the differences between the annual receipts and annual payments of foreign exchange made through overseas construction, as reported in the invisible trade balance statistics. Although not included in the figures, the earnings from the complementary exports of Korean construction materials and equipment during the period totaled $2,260 million (Overseas Construction Association of Korea 1986, p. 6).

6. Not all remittances reported in table 3 were made by Korean employees of Korean overseas construction firms. Although the proportions were small, some part of the remittances was from non-construction workers (mostly seamen) and construction workers employed by non-Korean firms (very small in number). As an example of the relative weights, at the end of 1982, the year of the largest remittances, of the 221,023 Koreans employed abroad, 171,170 were employees of Korean construction firms and 7,737 were employed by foreign construction firms in the Middle East.
Table 3. *Foreign Exchange Earnings of Korean Overseas Construction, 1979–86*  
(millions of dollars)

<table>
<thead>
<tr>
<th>Year</th>
<th>Foreign exchange earnings*</th>
<th>Remittances by workers</th>
<th>Goods trade deficitsb</th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1979</td>
<td>1,399</td>
<td>1,158</td>
<td>5,283</td>
<td>27</td>
<td>83</td>
</tr>
<tr>
<td>1980</td>
<td>1,451</td>
<td>1,292</td>
<td>4,787</td>
<td>30</td>
<td>89</td>
</tr>
<tr>
<td>1981</td>
<td>1,864</td>
<td>1,673</td>
<td>4,878</td>
<td>38</td>
<td>90</td>
</tr>
<tr>
<td>1982</td>
<td>2,256</td>
<td>1,939</td>
<td>2,397</td>
<td>94</td>
<td>86</td>
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<tr>
<td>1983</td>
<td>1,740</td>
<td>1,663</td>
<td>1,747</td>
<td>100</td>
<td>96</td>
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<tr>
<td>1984</td>
<td>1,646</td>
<td>1,490</td>
<td>1,387</td>
<td>119</td>
<td>91</td>
</tr>
<tr>
<td>1985</td>
<td>771</td>
<td>1,241</td>
<td>852</td>
<td>90</td>
<td>161</td>
</tr>
<tr>
<td>1986</td>
<td>459</td>
<td>1,077</td>
<td>1,925c</td>
<td>—</td>
<td>235</td>
</tr>
</tbody>
</table>

—Not applicable.

* a. Foreign exchange receipts from overseas construction less foreign exchange payments for overseas construction.
  
  b. Customs clearance base.

  c. Surplus.


of cost calculation. According to one estimation by the Overseas Construction Association of Korea, profits from the $17.8 billion in construction works completed by the end of 1983 were $380 million, indicating an average profit rate of 2.1 percent (*MaeKyung Weekly*, May 23, 1985, p. 55). The consensus is that profit rates in overseas construction have fallen in recent years.

Whatever the size of the individual components, the total foreign exchange earnings made available by overseas construction contributed greatly to an easing of balance of payments difficulties over the years. The total earnings of $11,127 million during 1979–85 were equivalent to more than 50 percent of Korea’s commodity trade deficits during the same period (see table 3). The resultant increased capacity to import capital goods and raw materials must have contributed to the rapid growth of the Korean economy. This contribution can be seen more directly by comparing annual foreign exchange earnings with gross national product (GNP). The ratio reached a peak of 3.3 percent in 1982 but dropped to 0.5 percent in 1986. If the total contribution to GNP is taken to include the domestic value added induced by the foreign exchange earnings as well, then the contribution ratios would have been even higher.7

Overseas construction also had a significant effect on employment. From the beginning, all Korean exporters of construction services to the Middle East

7. Rhee (1987, pp. 6–7), for example, estimates a ratio of 6.8 percent for 1982. But this must be an overestimation in the general equilibrium context, because the same estimation for domestic construction—or any other industry, for that matter—yields sectoral contributions totaling much more than the actual GNP.
took Korean workers with them. Both the shortage of local workers in the Middle East and the high productivity of Korean workers relative to wages encouraged construction firms to recruit Korean workers. From 1979 through 1984, the end-of-year stock of Korean workers employed abroad by Korean construction firms each year exceeded 100,000 (see table 4). From a peak of 172,000 Korean workers in 1982, the number declined continuously, reaching 59,000 in 1986. In the heyday of Korean overseas construction, Korean construction works in foreign countries accounted for 20 percent of construction industry employment.

III. Institutional and Policy Aspects

The reconstruction work after the Korean War and the presence of U.S. military forces in Korea contributed to the growth of the Korean construction industry during the 1950s and early 1960s. U.S. military projects provided opportunities for Korean firms not only to earn handsome profits but also to learn about international contracts. The amount of U.S. military construction work awarded to Korean firms declined after 1965 due to the “Buy American” policy and U.S. involvement in the Vietnam War.

The dispatch of Korean troops to South Vietnam in 1965 and 1966 presented an opportunity for Korean construction firms to participate in military construction projects abroad. South Vietnam marked the first case in which Korean workers and companies went abroad in large numbers and earned substantial amounts of money. This experience familiarized Korean workers with the opportunities for earning much higher wages abroad than they could in Korea.


Table 4. Contribution of Korean Overseas Construction to Employment, 1979–86

<table>
<thead>
<tr>
<th>Year</th>
<th>Employment in overseas construction (1)</th>
<th>Employment in nonfarm sectors (2)</th>
<th>Employment in construction (3)</th>
<th>(1) (2)</th>
<th>(1) (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1979</td>
<td>106</td>
<td>8,777</td>
<td>836</td>
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<tr>
<td>1980</td>
<td>135</td>
<td>9,029</td>
<td>843</td>
<td>1.5</td>
<td>16.0</td>
</tr>
<tr>
<td>1981</td>
<td>166</td>
<td>9,222</td>
<td>876</td>
<td>1.8</td>
<td>18.9</td>
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<td>1982</td>
<td>172</td>
<td>9,767</td>
<td>829</td>
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<tr>
<td>1983</td>
<td>164</td>
<td>10,190</td>
<td>817</td>
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<td>1984</td>
<td>131</td>
<td>10,515</td>
<td>905</td>
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<tr>
<td>1985</td>
<td>98</td>
<td>11,237</td>
<td>911</td>
<td>0.8</td>
<td>10.8</td>
</tr>
<tr>
<td>1986</td>
<td>59</td>
<td>11,843</td>
<td>889</td>
<td>0.5</td>
<td>6.6</td>
</tr>
</tbody>
</table>

Note: Employment figures for nonfarm and construction sectors are averages during the year, whereas employment figures for overseas construction figures are end-of-year figures.

a. Excludes those employed in agriculture, forestry, and fishing.

Sources: Overseas Construction Association of Korea (1986) and internal data.
(see Kim 1982 for details of the South Vietnam case). Although Korean construction firms expanded to markets such as Guam, Okinawa, and Alaska, these markets were not large enough to replace South Vietnam or to satisfy the desires of Korean firms and workers to operate outside the narrow domestic markets. Thus, after the first oil shock, the vast new construction markets in the Middle East became the natural, eagerly pursued targets for Korean construction firms. The Middle East market was ideal for Korean firms because of its size and virtual lack of restrictions on bringing Korean workers to the construction sites.

In December 1975, the government introduced the Overseas Construction Promotion Act (which became effective April 1, 1976) to support and control the Korean construction industry. In January 1976, the government established the Middle East Economic Cooperation Commission. The commission, a top-level economic policy decisionmaking body comprising the prime minister and relevant cabinet officials, had under it an interministerial task force to devise and coordinate the policies of various ministries. Also in 1976, a new bureau was added to the Ministry of Construction to deal solely with overseas construction. A government-supported research institute was established in the same year to promote studies of the Middle East economies. In May 1977, the Overseas Construction Association of Korea (OCAK) was established by government initiative to promote overseas construction activities and to provide for self-regulation of the industry.

In addition to these new major bodies to support or regulate overseas construction, the government established new rules on the migration of construction workers and labor management in foreign countries. The government designed a standard labor contract to be used by all Korean firms employing Korean construction workers overseas. In force since April 1977, its purpose is to prevent disputes between workers and employers on wages or working conditions in foreign countries. The contract specifies minimum wages, contract period, working hours, leave, travel fares, welfare facilities, casualty compensation, and worker responsibilities.

Among the new policy measures introduced by the government, those with the greatest impact concerned tax and financial incentives for overseas construction firms. The Overseas Construction Promotion Act states that exports of construction services and exports of goods should receive equal treatment in terms of government support. As Korea had a highly effective system of export promotion in the 1970s, this implied considerable help and lack of discrimination against construction services. Exporters received preferential treatment in bank credit and interest rates. To cover future losses, exporters were allowed to deduct from taxable income 1 percent of foreign exchange revenues. The same deduction was also available for the costs of seeking new export opportunities.

The tax incentives for overseas construction, however, were even more favorable than the incentives for goods exports. There was a 50 percent reduction
of corporate income tax for income from overseas construction. This direct tax support, however, was replaced by an indirect income deduction system in 1981. Under the new rule, overseas construction firms could deduct up to 2 percent of foreign exchange revenues from their taxable income (but only within the limit of 50 percent of the income from overseas construction). Construction firms were required to use this tax savings to balance past losses or to increase capital. Although originally planned to terminate at the end of 1986, the deduction system has been extended to 1991 because of the recent difficulties experienced by overseas construction firms. Other tax incentives include accelerated depreciation allowances for equipment directly used in overseas construction and an income tax reduction for workers employed abroad.

Probably the most important financial support for the overseas construction industry before the early 1980s was the granting of bid, performance, and advance payment bonds by a group of Korean banks. The value of contracts was increasing so fast that many construction firms were unable to provide sufficient collateral to get the bank guaranty required for the bonds. In response, the government in 1976 organized seven banking institutions to provide collectively the necessary guaranties for projects with contract values exceeding $50 million. This collective guaranty system lasted until May 1982. By then, as a result of an emphasis on greater independence in bank management, individual banks were offering guaranties based on their own assessments. Many other supporting policies were introduced in the late 1970s for overseas construction. Two of the more salient examples were the easing of foreign exchange regulations and the provision of overseas construction insurance.

A distinguishing characteristic of Korea's policies toward overseas construction has been the extensive government control in all phases of the business. The Overseas Construction Promotion Act deals more with government controls and intervention mechanisms than with support measures. For example, only firms with licenses for overseas construction from the minister of construction are allowed to operate abroad. Firms require permission from the minister of construction to bid on a contract for overseas construction. If more than two Korean firms plan to compete for a given project, the government can intervene to limit competition. For the same purpose, the government can also designate which firms can operate in a particular country or area. Firms planning to operate in a new foreign market must submit their bidding plans to the government.

Other controls, many of which are not legally specified, have also played important roles in the export of construction services to the Middle East. For instance, to increase the employment and earnings of Koreans, Korean firms

8. This tax incentive had been applied to all exports before the revision of export incentives in 1973.
9. Bank guaranties outstanding for overseas construction firms at the end of 1983 were about $6.9 billion. Over three-quarters of this was for performance and advance payment bonds. The amount outstanding declined to $5.7 billion by the end of 1985 (see Overseas Construction Association of Korea 1984, p. 120; 1986, p. 4).
have been advised to limit their employment of foreign workers. To minimize
the leakage of foreign exchange earned by Korean workers, Korean construction
firms were required to pay at least 80 percent of Korean workers' monthly
wages in won in Korea. Labor attaches from the Ministry of Labor supervised
labor relations and working conditions in Korean firms abroad.

IV. Competitiveness

In the international construction market, Korean firms have been especially
competitive in labor-intensive construction projects, as demonstrated by the
composition of Korean construction exports. During the ten-year period 1975–
84, Korean firms won contracts in the Middle East worth a total of $40.5
billion. About 85 percent of these contracts were for general building and civil
engineering works (see table 5), all closely related to residential and infrastruc-
ture development. These projects are labor intensive and do not require the
most sophisticated construction technologies.

At the other end of the construction market are projects that require special
skills and advanced technologies, such as plant construction, electricity or
communication facilities, and professional services in design, engineering, and
construction management. For these types of projects, Korean firms' perform-
ance was less impressive. Although plant construction constituted about a third
of the Middle East market, it accounted for less than 14 percent of the value
of contracts received by Korean firms (see table 5). This means that Korea's
revealed comparative advantage index, as measured in table 5, is only 43 for
plant construction, whereas the indexes for building and civil engineering are

<table>
<thead>
<tr>
<th></th>
<th>Civil engineering</th>
<th>Building</th>
<th>Plant</th>
<th>Electricity/communication</th>
<th>Service</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orders awarded in the Middle East</td>
<td>96,318</td>
<td>113,318</td>
<td>122,620</td>
<td>33,773</td>
<td>13,437</td>
<td>379,464</td>
</tr>
<tr>
<td>Share (percent)</td>
<td>(25.4)</td>
<td>(29.9)</td>
<td>(32.3)</td>
<td>(8.9)</td>
<td>(3.5)</td>
<td>(100.0)</td>
</tr>
<tr>
<td>Orders received by Korean firms</td>
<td>16,685</td>
<td>17,535</td>
<td>5,603</td>
<td>570</td>
<td>83</td>
<td>40,476</td>
</tr>
<tr>
<td>Share (percent)</td>
<td>(41.2)</td>
<td>(43.3)</td>
<td>(13.3)</td>
<td>(1.4)</td>
<td>(0.2)</td>
<td>(100.0)</td>
</tr>
<tr>
<td>Revealed comparative advantage index</td>
<td>162</td>
<td>145</td>
<td>43</td>
<td>16</td>
<td>6</td>
<td>100</td>
</tr>
</tbody>
</table>

Note: The original source of the international contracts data is various issues of the Middle East Economic Digest; the values of Korean exports do not coincide with those in table 1.

and 162, respectively. The indexes for electricity and communication construction and for professional services are also very low.

The reason for the Korean firms' comparative advantage in labor-intensive projects is of course that Korean labor costs are much less than those of Korea's major competitors. A low labor cost can be decisive in determining cost competitiveness for labor-intensive projects. Differences in labor costs become important when construction firms can bring their own workers instead of hiring local workers, as in the case of the Middle East markets.

But Korea's advantage in low labor costs is not limited to construction workers. Labor costs for Korean overseas construction firms are lower at all levels than costs for firms in industrial countries—from supervisors and engineers to the firms' managers in Korea. This is one reason firms from industrial countries cannot fully compensate for their labor cost disadvantage by using third-country labor. In addition, Korean firms' competitiveness came not only from an efficient and productive work force relative to wages but also from the fact that an all-Korean work force brought harmony, good teamwork, and savings in labor management costs.

Korea's competitiveness based on a low-cost Korean work force has been weakened in the international construction market since the early 1980s. Two factors are primarily responsible: the rapid decline of the labor-intensive construction market in the Middle East and the rise of Korean labor costs relative to the cost of workers from other labor-exporting countries. Construction market statistics show that building and civil engineering contracts in the Middle East have declined over the years as many of the residential and infrastructure construction projects neared completion. At the same time, the number of low-wage workers, mostly from South or Southeast Asian countries, has increased rapidly in the Middle East since 1980 (see Demery 1986 and ESCAP 1987, p. 16, for annual figures).

The increased supply of low-cost labor in the Middle East raises an important issue for Korea's future construction exports. In most of the Asian and African countries in which Korean construction firms operate, there is a sufficient supply of cheap labor, and the use of local labor is more often required and strictly enforced than in the Middle East. Observing these developments in the world construction market, Korean firms and policymakers have tried to restructure Korean construction exports in order to increase their share of more technology-intensive exports such as feasibility studies, design, engineering services, construction management, and operations and maintenance.

So far, however, Korean firms have not been competitive in this area. Lacking the necessary technology, Korean firms have not been able to bid on certain projects or have been able to bid only on the parts of the project that did not require sophisticated engineering knowledge. In many cases, Korean firms were subcontractors of major firms from industrial countries.

That Korean firms are not as competitive in design and engineering is re-
flected in the types of projects for which the Korean firms have won contracts (see table 5). It is also reflected in surveys of top international design firms conducted by *Engineering News Record*: only 4 Korean firms were among the top 200 international design firms in 1985, with total foreign billings of only $47 million, a 1.3 percent share (*Engineering News Record*, August 7, 1986).

Several efforts have been made to strengthen the design and engineering capabilities of Korean construction firms. The Korean government passed the Engineering Business Promotion Act in 1973 and offered tax incentives and domestic market protection to local design and engineering firms. Currently, the domestic market is protected by the prime contractor system, which limits the participation of foreign engineering firms. In 1983, the government supported the establishment of the Korea Institute of Construction Technology. And, by law, the minister of construction can recommend that construction firms with revenues over a certain level increase their expenditures for technology development.

Despite these efforts of the government and those of private firms, Korean construction firms have found it difficult to penetrate the “software” portion of the international construction market. Given the linkage between feasibility studies / design work and construction contracts, the weakness of Korean firms in engineering services diminishes their chances of winning construction contracts and limits Korean exports of construction materials and equipment.

Another weak area for Korean overseas construction firms is financing. Many developing-country importers of construction services ask contractors to finance the projects. It is believed that Japanese firms win more contracts in Asia than in other regions partly because the Japanese government concentrates its development grants and loans in Asian countries. Italy and France, along with Japan, are reported to be the leaders in contractor-financed projects (*Engineering News Record*, August 6, 1986). Unlike the firms from these countries, Korean firms lack the support of government aid programs and the ability to use the international financial market for low-cost financing. The Export-Import Bank of Korea offers long-term supplier credits, but the amount of available credit is quite low.

V. Prospects

Fierce competition, reduced government support, worsening payment schedules, and a shrinking construction market have forced many Korean construction firms to withdraw from the Middle East market during the last several years. The contraction of the world market and the erosion of Korean competitiveness in labor-intensive works were not recognized early enough to allow Korean firms and policymakers to adjust. Many Korean firms had to bid low just to stay in business. Low biddings, however, meant losses. At the end of 1986 and again in early 1987, the government adopted new measures to
rationalize the overseas construction industry, providing adjustment assistance
to firms willing to withdraw from the overseas construction market and surren-
der their licenses for overseas construction.

Given that Korea is losing its competitiveness in labor-intensive work and
has not yet gained sufficient competitiveness in skill-intensive or technology-
tensive work, Korea's comparative advantage in the world construction mar-
ket for some time in the future will be in medium-level technology projects. In
these projects, Korean firms can beat both the low-wage, low-technology com-
petitors from developing countries and the high-technology, high-wage compet-
itors from industrial countries. A combination of medium-level technologies
and medium-level labor costs can be very effective in winning contracts for
building and civil engineering works in industrial countries. For this reason,
Korean firms are trying hard to enter the U.S. and Japanese construction
markets, but as yet they have had little success.

Korean firms began to focus on the U.S. market after the decline of the
Middle East market. In 1985 and 1986, Korean firms won new contracts in
the United States valued at $49 million. But their market share among foreign
firms operating in the United States was only 0.4 percent in 1985 (Choi 1986).

In Japan, Korean firms have not yet won a single construction contract, nor
has any Korean firm yet incorporated a subsidiary in Japan, mainly because
Japanese policies protect the domestic construction market. (Even U.S. firms
did not win any contracts in Japan in 1985, whereas Japanese firms received
$2 billion in orders in the United States; Asian Wall Street Journal, December
9, 1986.)

The desire to penetrate the construction market in industrial countries is a
major factor behind Korea's active participation in the Uruguay Round of
multilateral trade negotiations. It is probable that the negotiations will result
in the lowering of trade barriers to services among the industrial countries and
some newly industrialized countries, but it is unlikely that most developing
countries will open their service markets significantly to foreign competition.
One way industrial countries could entice developing countries to open their
service markets is to take advantage of the linkage between concessions on
goods and concessions on services. Although most developing countries oppose
this linkage, the industrial countries may offer "rollbacks and standstills" on
goods of export interest to developing countries in return for access for services.

Because it is neither necessary nor desirable to produce domestically all the
services that are consumed domestically, Korea could gain by opening at least
some of its service markets, particularly if in so doing it could increase its
access to foreign markets. Liberalizing all trade in goods but protecting all
services will simply promote misallocation of resources. Korean construction
firms, however, except perhaps those with overseas construction licenses, worry
about the opening of the domestic construction market to foreign competition.
Opponents of liberalization argue that the engineering sector is an infant indus-
try and that, with protection, it will become an export industry in the near future.

In the current negotiations on trade in services, Korea is especially interested in the issue of factor mobility, specifically the extent to which temporary movement of labor will be allowed into the industrial countries. As discussed earlier, the competitiveness of Korean exports of construction services to industrial countries is heavily dependent on the number of Koreans that Korean firms can bring in with them.

There is an argument that labor mobility should be separated from the negotiations on other forms of services because questions relating to visas and work permits are even more sensitive than pure trade matters. But as Grubel (1986) argues convincingly, free trade in goods and free movement of capital and people are essential for free trade in services. Thus it is difficult to see how the issue of temporary migration can be separated from that of the movement of capital. Moreover, as Bhagwati (1987) clearly explains, the concept of the “right to establish” cannot meaningfully or justifiably be circumscribed to exclude the inward mobility of foreign labor and its services.

Korean contractors and policymakers find it hard to accept the idea that only predominantly capital- or technology-intensive services should be included in the negotiations. For construction services, this narrow coverage means that only consulting and engineering services are included. Most construction services require that the provider of services go to the user. It is not possible to draw a line distinguishing the services of technology or capital from the services of labor.

VI. Concluding Comments

The early successes of Korean overseas construction firms in the Middle East led to overexpansion into that region. Declining orders and increased competition from foreign firms and among Korean firms reduced both the level of operations of Korean firms and their profits. Many firms suffered losses, and the government intervened in order to rationalize the industry. The government’s current policy seems to be to reorganize the industry so that only a limited number of financially healthy construction firms engage in foreign business, and to develop new markets, especially in the United States and Japan.

The Uruguay Round negotiations on trade in services are important to the Korean overseas construction industry, which many Koreans believe to be the service industry that can benefit most from increased access to foreign markets. The key factors that will determine the effects of the negotiations on the Korean overseas construction firms are whether developing countries also liberalize their imports of construction services and the extent to which industrial countries allow inflows of Korean construction labor.
Developing countries that have supplied construction workers to the Middle East over the years should be eager to find efficient uses in other countries for their large stocks of experienced and skilled construction workers, available at relatively low wages. The Korean experience shows the possibilities for construction firms from such countries, using their own workers, in the world market in labor-intensive, low-technology projects. The issue of labor movement in services trade negotiations is as important for these developing countries as it is for Korea.

References


Some Policy Lessons from the Opening of the Korean Insurance Market

Yoon Je Cho

This article examines the recent dispute between the United States and the Republic of Korea over the opening of Korea's insurance market to U.S. companies. The article assesses the interests and motivations of both countries that lay behind the formal arguments presented during the negotiation process. It also analyzes whether the long-run interests of both developing and industrial countries would be well served by the approach to the opening of the market adopted in this case—sharing the rent while continuing to regulate the insurance market. The analysis suggests that the opening of a developing country's insurance market (or the wider financial services market) would serve the long-run interests of both developing and industrial countries only if it were accomplished in the context of overall domestic liberalization of the finance industry. “Opening” of the market, if this means only the sharing of the rents that were generated by regulation of the market, is unlikely to be beneficial to developing countries.

This examination of the recent United States–Korea trade dispute over the limitations placed on the access of U.S. firms to the Korean insurance market provides an opportunity to investigate the interests and motivations of industrial and developing countries with respect to international transactions in financial services. The article also derives some policy lessons for other developing countries that may face a similar trade negotiation environment.

Section I of the article briefly discusses the policies of the government of the Republic of Korea with respect to the insurance market, describes the structure and size of the market, and suggests some reasons for the strong interest of U.S. firms in entering the market. Section II introduces the trade dispute, and describes the issues between the two countries and their respective positions on these issues during the negotiations pursued under Section 301 of the U.S. Trade Act (see appendix). It also investigates the motivations underlying the formal arguments during negotiations and describes the bargaining counters.
used by each party. Section III draws some conclusions from the case and identifies their implications for future negotiations between developing and developed countries on transactions in financial services. Section IV examines the national welfare implications of the relationship between the opening of financial services markets and the regulation of these markets and elaborates on the policy lessons that can be derived for other developing countries facing similar trade negotiations.

I. The Korean Insurance Market

The Korean insurance industry is young (most insurers in the market date back only to the 1950s), but its growth has been rapid, owing to rapid economic growth and to strong government encouragement of the industry. The government has created various types of compulsory insurance and has authorized life insurance companies to receive a quasi-pension type of savings and to claim tax deductions on premiums.

Although government policy has fostered rapid expansion of the insurance industry, it has also imposed various restrictions on the industry that have inhibited its efficient development in terms of quality of service and international competitiveness. The government regulates asset management, with the objective of channeling funds into the finance of strategic industrial sectors designated by the government. The government also exercises detailed control over the business activities of insurance firms, through formal regulations, administrative guidance, or both. Premium rates are strictly controlled. The government has severely restricted entry into the industry and has tried to limit competition, both domestic and foreign.¹

More recently, however, in conjunction with the overall economic liberalization policy pursued since 1980, the government has allowed more autonomous management and freer competition among insurance firms. But the pace of liberalization in insurance has been slow.

Life Insurance

At the end of 1986, the life insurance industry was dominated by six companies, all of them Korean.² No firm, either domestic or foreign, had been allowed entry to the life insurance market for three decades (except to sell insurance to resident aliens).

Life insurance firms in Korea are primarily savings institutions. About 95 percent of premium income comes from savings, which are in a form similar to time deposits at banks. Only 5 percent of premiums are paid directly for

¹. Koreans often describe this protective policy as a "fleet policy," which means that the government wants every insurance company to achieve a similar market share and profit. It does not want any company to fail.

². The insurance industry in Korea is divided strictly into life and nonlife insurance. No company may handle both types of business.
insurance. Thus the rapid growth of life insurance companies has been due largely to their role as savings institutions rather than to demand for insurance.

To a great extent, this feature of Korea's life insurance business is due to government policy. In the 1960s, in order to mobilize domestic resources to finance its ambitious economic growth plans, the Korean government designated life insurance companies as savings institutions, eligible to receive a quasi-pension type of savings from groups of employees of companies and associations. The government has also used other measures to encourage the role of life insurance companies as depositories of savings.

The growth of the life insurance industry, and of other nonbank financial institutions such as investment and finance companies, has been particularly rapid in recent years (see table 1). This growth received its impetus from two main factors: (1) a reduction in inflation, which attracted financial savings to nonbank financial institutions, especially long-term savings institutions such as life insurance companies (which also offered higher interest rates than did the banking sector) and (2) the Korean government's domestic financial liberalization policy, which enhanced the attractiveness of financial savings.

The ratio of life insurance premium income to gross national product (GNP) provides an indication of the speed and extent of the growth of the life insurance industry. In 1980 this ratio was 1.6 percent, but by 1983 it had reached 4.0 percent, a higher value than in the United States or the United Kingdom (see table 2). By 1984 it had reached 4.7 percent.

Despite this rapid growth, however, available evidence suggests that Korean life insurance firms have not reached the levels of efficiency and competitiveness achieved in most industrial countries. Government regulation of premium rates and asset management of Korean life insurance firms has led to inefficiency and

<table>
<thead>
<tr>
<th>Table 1. Growth of the Korean Insurance Industry, 1976–84</th>
</tr>
</thead>
<tbody>
<tr>
<td>(in billions of won)</td>
</tr>
<tr>
<td>Premium income</td>
</tr>
<tr>
<td>Life insurance</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Nonlife insurance</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Total assets</td>
</tr>
<tr>
<td>Life insurance</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Nonlife insurance</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>GNP</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>GNP deflator</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

*Note: Figures in parentheses are annual growth rates in nominal terms.*

*Sources: Korea Insurance Corporation (1986); Republic of Korea (1986).*
Table 2. Comparison of the Life Insurance Industry in Selected Economies, 1983

<table>
<thead>
<tr>
<th>Item</th>
<th>Korea</th>
<th>United States</th>
<th>Japan</th>
<th>United Kingdom</th>
<th>Taiwan</th>
<th>Malaysia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per capita GNP (U.S. dollars)</td>
<td>1,884</td>
<td>14,093</td>
<td>9,696</td>
<td>8,144</td>
<td>2,744</td>
<td>1,849</td>
</tr>
<tr>
<td>Life insurance premium paid (millions of U.S. dollars)</td>
<td>2,915</td>
<td>80,809</td>
<td>49,106</td>
<td>16,280</td>
<td>684</td>
<td>-</td>
</tr>
<tr>
<td>Per capita premium paid (U.S. dollars)</td>
<td>72.9</td>
<td>344.7</td>
<td>411.8</td>
<td>289.0</td>
<td>36.8</td>
<td>-</td>
</tr>
<tr>
<td>Premium per GNP (percent)</td>
<td>4.0</td>
<td>2.44</td>
<td>4.15</td>
<td>3.71</td>
<td>1.48</td>
<td>0.85</td>
</tr>
</tbody>
</table>

Sources: Republic of Korea (1986); Swiss Reinsurance (1985).

a sort of cartelized market. One recent study shows that the Korean life insurance companies' management expenses (or their intermediation costs as financial institutions) are much higher than those of commercial banks for the same amount of savings mobilization (Lee, Kim, and Park 1986). The study suggests that if commercial banks were to add an insurance feature to their time deposits, they could fulfill the same function as life insurance companies but at a much lower cost. Another indication that Korean insurance firms have not been wholly efficient in serving buyers of insurance is the prosperity of insurance providers organized outside the mainline insurance industry, such as the Marine Association Mutual Insurance Fund and the Teachers Association Mutual Insurance Fund.

Nonlife Insurance

Total premium income of nonlife insurance companies is currently about 28 percent of that of the life insurance industry, and the share has been shrinking since 1980 because of the rapid growth of the life insurance industry. Thirteen companies are licensed to sell nonlife insurance, including two U.S. firms and three joint ventures between Korean and non-Korean companies.

Until recently, nonlife insurance in Korea has been dominated by the pool system, in which member firms share total premium income according to a preestablished formula. Mortgage insurance, marine insurance, and compulsory fire insurance companies operated as pools from their beginnings, whereas automobile insurance was monopolized by a government-sponsored insurance company. Although the pool system and the monopolies have been gradually phased out during the 1980s, some categories of insurance, such as compulsory fire insurance, still operate under the pool system. 3

The nonlife insurance industry has few incentives for innovation or improvement of the quality of service or marketing skills. This situation may account for the industry's failure to penetrate the household sector: as of 1985, only 13 percent of nonlife insurance business came from household customers, whereas

3. In seven major cities of Korea, buildings of more than four stories are required by law to have fire insurance, which is operated in the pool system and is referred to as the compulsory fire pool.
Table 3. Selected Indicators of the Size of the Korean Insurance Industry and Its International Standing, 1980–84

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Premium paid (millions of U.S. dollars)</td>
<td>1,502</td>
<td>2,024</td>
<td>3,096</td>
<td>3,877</td>
<td>4,785</td>
</tr>
<tr>
<td>(23)</td>
<td>(19)</td>
<td>(14)</td>
<td>(12)</td>
<td>(11)</td>
<td></td>
</tr>
<tr>
<td>Life</td>
<td>915</td>
<td>1,317</td>
<td>2,250</td>
<td>2,915</td>
<td>3,728</td>
</tr>
<tr>
<td>(17)</td>
<td>(13)</td>
<td>(11)</td>
<td>(10)</td>
<td>(7)</td>
<td></td>
</tr>
<tr>
<td>Nonlife</td>
<td>587</td>
<td>707</td>
<td>846</td>
<td>962</td>
<td>1,056</td>
</tr>
<tr>
<td>(24)</td>
<td>(23)</td>
<td>(20)</td>
<td>(19)</td>
<td>(17)</td>
<td></td>
</tr>
<tr>
<td>Per capita premium paid (U.S. dollars)</td>
<td>39.4</td>
<td>52.3</td>
<td>78.7</td>
<td>97.5</td>
<td>117.9</td>
</tr>
<tr>
<td>(31)</td>
<td>(31)</td>
<td>(25)</td>
<td>(24)</td>
<td>(23)</td>
<td></td>
</tr>
<tr>
<td>Life</td>
<td>24.0</td>
<td>34.0</td>
<td>57.2</td>
<td>72.9</td>
<td>91.9</td>
</tr>
<tr>
<td>(24)</td>
<td>(23)</td>
<td>(20)</td>
<td>(19)</td>
<td>(17)</td>
<td></td>
</tr>
<tr>
<td>Nonlife</td>
<td>15.4</td>
<td>18.3</td>
<td>21.5</td>
<td>24.1</td>
<td>26.0</td>
</tr>
<tr>
<td>Premium paid per GNP (percent)</td>
<td>2.89</td>
<td>3.34</td>
<td>4.82</td>
<td>5.28</td>
<td>6.05</td>
</tr>
<tr>
<td>(20)</td>
<td>(20)</td>
<td>(12)</td>
<td>(10)</td>
<td>(7)</td>
<td></td>
</tr>
</tbody>
</table>

Note: Figures in parentheses are Korea's rank in the world insurance business.
Sources: Korea Insurance Corporation (1986); Swiss Reinsurance (1985).

corporate customers accounted for 87 percent (Korea Insurance Corporation 1986).

Interest of U.S. Firms in the Korean Insurance Market

The Korean insurance market is quite large by international standards. In terms of total premiums paid, as of 1984 only ten national markets were larger than that of Korea, which ranked seventh in life insurance and seventeenth in nonlife insurance. In terms of the ratio of premiums paid to GNP, Korea ranked seventh in the world (see table 3).

Because of the large size of the market, its high growth potential in a rapidly growing economy, and the relative inefficiency of the local insurance industry, the market is very attractive to foreign firms. Some U.S. insurers have already obtained limited entry to the market because of the special relationship between the United States and Korea. These firms have recently become more actively interested in expanding their business and therefore in removing the restrictions under which they must operate. In addition, U.S. firms that have not yet entered the market are also more interested in Korea as a potential source of business.

II. The United States–Korea Dispute on the Opening of the Korean Insurance Market

Since 1968, several foreign insurers have been licensed to underwrite certain kinds of life and health insurance policies for resident aliens, including U.S. Armed Forces personnel and their families. At present, seven U.S. companies provide such insurance in Korea.

4. This section draws heavily on Cho (1987b).
In 1968, two U.S. insurers, American Home Assurance Company (AHA) and American Foreign Insurance Association (AFIA), received licenses to underwrite other kinds of insurance for resident aliens. Later, in 1977 and 1978, these companies were also licensed to write fire and other casualty policies for Korean nationals.\(^5\)

In September 1985, the U.S. Trade Representative (USTR) initiated an investigation under Section 301 of the U.S. Trade Act into Korea's policy of prohibiting or restricting U.S. firms from providing insurance services.\(^6\) The opening of the life insurance market and the compulsory fire pool was a central issue.

The U.S. government demanded that the compulsory fire pool be dismantled or that the two U.S. firms operating in Korea be given access to the pool, with shares of premium income equal to those of the Korean firms. Because the Korean government had specific reasons for opposing abolition of the pool, including an unwillingness to immediately close down the company that organized and managed the pool, the ensuing negotiations focused on the participation of the U.S. firms and their shares in the fire pool. In addition, the United States demanded that several U.S. firms be licensed to sell life insurance by June 1986 and that three additional nonlife insurance firms be licensed by the end of 1987.

**U.S. Position and Motivation**

The United States approached the case on legal grounds, based mainly on "national treatment" arguments. The U.S. firms argued in their petition that the Korean government's restrictions on their access to the life insurance and compulsory fire insurance markets denied them the benefits to which they were entitled under the 1956 Treaty of Friendship, Commerce, and Navigation between the United States and Korea.\(^7\) They alleged that the policies of the Korean government violated its treaty obligations and the international legal norms incorporated in Section 301(e). The USTR transmitted these arguments to the Korean government without alteration.

Why did the U.S. firms chose this moment to make their complaints? One

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5. In October 1984, AFIA transferred its license to CIGNA, another U.S. insurer.
6. This was not the first U.S. case brought under Section 301. In 1979, AHA filed a petition on the grounds that it was not being treated equally to other firms in the Korean nonlife insurance market. Its complaint was based upon its exclusion from the pools for noncompulsory and compulsory fire insurance. AHA also alleged that it was excluded from the marine insurance market. In 1981, the Korean government responded by licensing AHA and AFIA to write marine insurance. By 1984, the noncompulsory fire pool had been abolished, and the U.S. insurers were given unrestricted licenses to underwrite noncompulsory fire insurance, pursuant to an agreement in connection with the Section 301 petition filed in 1979. Life insurance was not an issue in this petition.
7. The treaty specifies: "Neither party shall take unreasonable nor discriminatory measures that could impair the legally acquired rights or interests within its territories of nationals and companies of the other party in the enterprises which they have established . . . [and that] nationals and companies of either party shall be accorded national treatment with respect to engaging in all types of commercial, industrial, financial and other activities for gain (business activities) within the territories of the other party, whether directly or by agent or through the medium of any form of lawful juridical entity."
plausible explanation lies in the recent explosive expansion of the Korean life insurance industry and projections of strong future growth. These characteristics, combined with the relatively inefficient management of Korean insurance firms and the oligopolistic structure of the market, made entry potentially very profitable. In particular, the fire pool, although accounting for only 3 percent of the fire insurance market, was the most lucrative part of the nonlife insurance market, so U.S. firms had a strong interest in sharing in its profits.

Entry would also enable U.S. firms to invest in the Korean capital market, in which investment by foreign nationals was restricted. Investments in the Korean capital market by foreign bank branches and special funds managed by foreign finance companies (such as the Korea Fund) have been very profitable.

Korea's Position and Motivations

Korea argued that limiting foreign entry did not violate "national treatment" because the policy of protecting the industry from overcompetition and securing its stability also involved restrictions on the entry of domestic firms. For example, the government had limited the number of domestic life insurance firms to six during the last thirty years. Therefore, it argued, U.S. firms were treated no differently than domestic firms that did not succeed in gaining access to the life insurance market.

Behind the formal arguments, however, Korea's restrictions seemed to be motivated largely by three concerns. First, the Korean government believed that the inefficiency of domestic firms relative to U.S. firms would lead to a significant reduction in the market share of domestic firms, resulting in bankruptcies among inefficient firms and serious instability in the financial market. That the increased competition resulting from the entry of U.S. firms would probably improve the quality of service and the efficiency of domestic firms was admitted by the government. It believed, however, that improvements in efficiency and welfare could be obtained through deregulation and by enhancing competition among domestic firms, and that foreign entry was not essential to achieve that goal. Second, the government did not want foreign firms to share in the rent generated by the oligopolistic structure of the insurance industry, which had developed as a result of extensive government regulation and protection. A third concern, given the government's intention to continue to regulate and control the insurance industry, was its belief that foreign firms are harder to control than domestic firms, a belief that was based on its experience in dealing with foreign bank branches in Korea.

The Negotiation and Its Results

Negotiations between the U.S. and Korean governments took place in November 1985 (Washington, D.C.), December 1985 (Seoul), and June 1986 (Seoul). The United States demanded that Korea (1) permit full participation

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8. A discussion of whether regulation should be relaxed on efficiency grounds is beyond the scope of this article.
of the two U.S. firms in the compulsory fire pool; (2) allocate shares of fire pool premium income equally among the U.S. and Korean firms; (3) allow other U.S. insurers (the number of companies was unspecified) to enter the life insurance market by the end of June 1986; and (4) allow three additional nonlife insurance firms and four life insurance firms to enter the market by the end of 1987.

The initial Korean response was to propose that the issues be discussed in a multilateral forum, through the dispute-settlement procedures of the General Agreement on Tariffs and Trade. The Koreans felt that their trade surplus with the United States and their weak political position vis-à-vis the United States underminded their bargaining position in bilateral negotiations under Section 301. Korea also wanted a multilateral forum because it believed that multilateral negotiations would take more time than bilateral negotiations, thus permitting it to maintain the status quo in the insurance market for a longer period.

The Korean suggestion was not accepted by the United States. The USTR threatened to recommend that the president take action against Korea's exports to the United States if the issues were not resolved by September 1986.

The threat was effective. The United States is a major Korean export market, accounting in 1985 for 35 percent ($10.7 billion; billion is 1,000 million) of total exports and a trade surplus of about $4 billion (Republic of Korea 1987). Moreover, the increasingly protectionist stance of the U.S. Congress put the U.S. negotiators in a strong position. The threat of possible cuts in the Generalized System of Preferences (GSP) and of increased protection against Korea's major exports (such as electronics, textiles, footwear, and steel) provided the United States with effective leverage for obtaining concessions in the insurance market.

Korea, meanwhile, had little leverage. Under these circumstances, the Korean government believed that the best that it could achieve would be to postpone a massive influx of U.S. firms.

On July 21, 1986, the two governments simultaneously announced the results of the negotiations. Most of the U.S. demands were accepted. Specifically, the government of Korea agreed (1) that the two U.S. firms would participate in the fire pool by July 1986; (2) that the member companies would determine the method of sharing pool premium income, with the Korean government ensuring that the distribution would be equitable (in a supplementary announcement immediately following this one, the Korean government agreed that U.S. firms would get the same share as Korean firms);9 (3) that one U.S.

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9. The United States had proposed that equal shares of premium income be distributed among companies, whereas Korea had proposed that the income be shared on the basis of company size. The two U.S. firms (which are branches) are much smaller than the Korean firms; their total share in the nonlife insurance market is less than 2 percent.
firm would be licensed to enter the life insurance market by the end of 1986; and (4) that qualified U.S. firms would be permitted to enter both the life and nonlife insurance markets.

III. CONCLUSIONS FROM THE TRADE DISPUTE CASE

Four conclusions can be drawn from this dispute and its outcome. First, it is probably more realistic to approach insurance transactions (or more broadly, transactions in financial services) between developed and developing countries in the context of international investment rather than international trade. The United States presented its arguments in the dispute strictly in those terms. The U.S. government suggested that multilateral negotiations on trade in services should be restricted to nonfactor services, that is, services that can be traded between countries in the conventional sense, without requiring the relocation of either buyer or seller. Such trade in financial services, however, can be realistically considered only among countries without foreign exchange controls and restrictions on capital account transactions. In other words, a person or firm wishing to buy an insurance policy or to undertake financial transactions with firms (or banks) in a developed country must first be able to convert domestic currency freely into the foreign currency. In most developing countries, however, foreign exchange and capital accounts are strictly controlled. Thus it is necessary to establish a local entity in order to sell financial services in these countries.

A second conclusion is that both governments basically represented the interests of their insurance firms. They entered the negotiations with the perception that the main issue was the sharing of profits (or rents) in Korea's insurance market. Broader considerations—for example, the effect of the outcome of the negotiations on economic efficiency or consumer welfare—seem not to have arisen.

The issues from the beginning were those of “national treatment” and U.S. entry to the market through “establishment.” The U.S. government concentrated its efforts specifically on improving access for U.S. firms to Korea's relatively inefficient, highly regulated (and oligopolistic) insurance market. Alternatively, it could have pressed for relaxation of the strong domestic regulation of the Korean insurance industry and for freer general conditions of entry.

Issues such as deregulation of cartelized premium rates did not assume any importance in the negotiations. This fact partly reflects the sensitivity and

10. The advisability of liberalizing the capital market in developing countries in which there are still many distortions in the commodity market is a matter of controversy. The experience with liberalization in the Southern Cone countries suggests the importance of the order in which liberalization takes place; premature opening of the capital market in the presence of domestic market distortions can cause serious macroeconomic disruptions and massive capital flight.
difficulty of the issue of domestic policy reform in financial markets and the strong objections of developing country governments to such discussions. However, it also reflected a U.S. interest in obtaining for U.S. firms a share of the profit and rent of Korea's highly protected and oligopolistic market. Whether the repeated application of such an approach in other developing countries would improve welfare in the world economy is highly questionable.

The third conclusion is that, given the strong U.S. pressure for opening up the market and the threat of retaliation against Korea's exports to the United States, the Korean government's decision to open the insurance services market to U.S. firms made economic sense. By accommodating the U.S. demand, Korea chose more trade rather than less. The potential loss in exports as a result of U.S. retaliation would lead to a far greater reduction in GNP than would opening the insurance market to U.S. firms.\footnote{For example, the United States apparently suggested at one point in the negotiations that if Korea refused to open its insurance market, the United States would cut its GSP grant to Korean exports and increase protection, thus reducing the volume of Korea's major exports. Had there been a 50 percent cut in the GSP grant and a 5 percent reduction in the export volume of Korea's major exports, Korea would have experienced a 1.5 percent reduction in total exports, or roughly a 0.4 percent reduction in annual GNP. The cost to Korea of allowing entry to the U.S. insurers, however, would be less than 0.01 percent of GNP (assuming they received 2/13 of the compulsory fire pool business and a 5 percent share in the rest of the insurance market and had a net profit rate of 2 percent of total premium revenue). A variety of other scenarios under different assumptions are explored in Cho (1987a), all with essentially similar results.}

If, in addition, the cost of protection and the benefits of increased competition (improvements in efficiency and consumer welfare) are included in the calculation, the net cost of refusing U.S. entry would be even greater.\footnote{There may also be direct and indirect benefits in terms of technological, pecuniary, marketing, or entrepreneurial stimuli that result from the entry of foreign firms. See Lall (1978) and Caves (1974) for a discussion of the effect of foreign investment in host country markets.}

A fourth conclusion relates to the issue of deregulation versus the sharing of rents in a protected, cartelized market. The principal concern of the Korean government during the negotiations was not to lose the domestic firms' market and profit shares to U.S. firms and to protect domestic firms from the shock of foreign competition. Despite the Korean recognition of the positive effects that could result from increased competition, the government gave little consideration to liberalizing the domestic market as an element of its response to U.S. demands. In a sense, the government entered negotiations with the assumption that it would maintain the current level of regulation of insurance firms. From this position stemmed its decision to allow U.S. firms to enter and share equally in the premium income of the compulsory fire pool—rather than to disband the pool and deregulate the market so that rents from the protected and cartelized market would disappear.

Given the current trade negotiation environment, developing countries like Korea may need to consider which approach would better serve their national
interest: to maintain protected and cartelized market structures and share the resulting rents with foreign firms or to deregulate these markets and allow the rents to be redistributed to buyers through competition.

IV. DEREGULATION OF DOMESTIC MARKETS:
AN ALTERNATIVE STRATEGY FOR DEVELOPING COUNTRIES IN THE CURRENT TRADE NEGOTIATION ENVIRONMENT

What is the best strategy for developing countries in the current international trade environment? The effects of different policy options on national welfare can be illustrated with a diagram such as figure 1, which is a simple supply and demand curve for insurance services.\(^{13}\)

Suppose that in a protected insurance market, the government-regulated premium rate is \(P_c\). Then \(I_c\) is the amount of insurance services sold, the combined area of \(W\) and \(X\) is the rent to insurance companies, and the triangular area \(Y\) is the welfare loss. If the country continues its market protection with regulated premium rates while allowing foreign companies to enter and share the market (\(I_f\), being their market share), then the total welfare loss to the national economy would be \(Y + X\), where \(X\) is the rent going to foreign firms, which they may repatriate to their home country.\(^{14}\) Thus a country’s welfare may worsen after allowing foreign firms to enter a domestic market in which prices are regulated.

If, instead, the country deregulates the domestic market and allows more competition, then the rent that insurers received under regulation will go to the buyers, and the increased competition will achieve the further welfare gain \(Y\). In addition, in the competitive market, domestic insurance firms will have a strong incentive to learn from foreign firms, which will in turn lead to advances in technology, innovation, improvement of management skills, and so on. This effect may shift the overall domestic supply curve \(S\) (including both domestic and foreign firms) down to \(S'\). If this happens, the welfare gain \((Y + Z + \text{part of } Z')\)\(^{15}\) will be greater than under domestic deregulation without entry of foreign firms \((Y)\).\(^{16}\)

13. Figure 1 illustrates the effects of different policy options on national welfare. It should be noted, however, that the figure abstracts from various complicated insurance market issues such as adverse selection and the moral hazard effect. In the insurance market, we cannot draw a simple upward sloping supply curve and a downward sloping demand curve, because under conditions of asymmetric information they may be subject to adverse selection and the moral hazard effect. In some cases, the market may even fail to achieve a stable equilibrium point (see Rothschild and Stiglitz 1976).

14. The profit going to foreign firms may be even larger than \(B\) because their supply curve may lie below curve \(S\) because of their efficiency. But the part larger than \(B\) would not be a net cost to the host country in terms of the opportunity cost concept.

15. The welfare gain will be only some part of \(D'\) with the remainder being increased profit for foreign firms.

16. This argument is based on partial equilibrium analysis. The welfare gain may be greater in the general equilibrium context.
This analysis suggests that if a country takes the policy option of allowing foreign entry while maintaining regulation, the result may be in a net loss \( (X) \) to the economy, whereas if it takes the policy option of allowing foreign entry while deregulating the market, the result would be an increase in the welfare of the economy \( (Y + Z + \text{part of } Z') \) beyond what could be achieved without foreign transactions \( (Y) \).

Despite the teachings of simple economic theory, many developing-country governments intervene to protect cartelized market structures. Advocates of such policies often justify them in terms of externalities of one kind or another.
or second best arguments (for example, the need to take into account market imperfections or the instability of price equilibrium when markets are thin). It is also true, however, that underlying these arguments is the desire of governments to maintain their political power to distribute rents—or to retain their leverage over the private industrial sector through their power to distribute rents.

For this reason and others, the financial services industry in developing countries is often heavily controlled by the government. It is not the purpose of this article to take a position on the merits of this approach, although it is worth noting that many empirical studies suggest that government intervention only increases distortions and inefficiency.

Rather, the purpose of this article is to suggest, through the example of the United States-Korea trade dispute and the simple market analysis presented above, that developing countries facing strong pressure to open their financial services markets to foreign firms can increase their national welfare by liberalizing the domestic market when (or preferably before) opening it to foreign firms. In other words, the case for deregulation of domestic financial services markets in developing countries becomes stronger in the current international trade environment. For a developing country government that insists on maintaining a regulatory and protective regime that generates rents for service suppliers, the current trade environment will increase the cost of this policy. For a developing country that initiates deregulation and develops a competitive domestic market environment, however, the current trade environment offers an opportunity to enhance national welfare.

V. CONCLUSION

Financial services markets (including banking and insurance) are heavily regulated and protected by the government in many developing countries. Market structures are oligopolistic, and prices are often set by cartels. This heavy government intervention and lack of competition have led to inefficiencies in the financial services industries in these countries.

Restrictive government policies are often justified in terms of externalities and market imperfections. But many developing countries have regulated their financial services industries as an element of industrial policy, in order to promote strategic industries by providing them with preferential access to credit at low cost. In the process, the profitability of financial institutions has been

17. Governments in many developing countries control or own the financial services industry as a tool of their industrial policy. Governments set prices which may not reflect market conditions, and then direct asset management in support of strategic industrial sectors.

18. For example, a recent liberalization of banks and nonbank financial intermediaries in Korea has substantially increased the efficiency of credit allocation (see Cho and Cole 1986).
supported by government-determined interest rates, service fees, or premium rates that often do not reflect market conditions.

The international trade environment has recently changed and is less favorable for developing countries. Increasingly, industrial countries are retaliating against the various financial and fiscal subsidies that developing countries provide for their exports by establishing countervailing duties and other protective measures. At the same time, industrial countries (especially the United States) are exerting stronger pressure on developing countries to open their financial services markets to foreign firms.

Economists have made a strong case for financial services market liberalization in developing countries on the grounds of economic efficiency and growth. This argument has not been well received by many developing countries for various reasons, including its variance from their own economic philosophies. This article has argued, however, that the case for liberalization of domestic financial services is stronger under the current international trade negotiation environment, notwithstanding the various arguments used by developing countries to justify maintaining their regulatory and protective regimes.

It can also be argued that industrial countries should encourage developing countries to move toward liberalization of their financial services sector. But “liberalization” of financial services may not be beneficial to developing countries if opening the financial services market is considered by both sides to mean sharing the rents generated by regulation of the market—as in the United States–Korea case—rather than opening the domestic market to competition. If this approach becomes widespread, developing countries may become increasingly reluctant to open their markets, while continued government regulation and the inefficiencies resulting from lack of competition will restrict the development of financial services markets. By limiting the markets or the size of the markets that firms from industrial countries can enter, this approach may lead to economic losses in the long term for industrial countries as well. Liberalization of transactions in financial services will be beneficial to both developing and industrial countries in the long run only if market expansion is discussed in the context of overall liberalization of domestic financial services in developing countries.

**Appendix: Section 301 of the U.S. Trade Act**

Section 301 of the U.S. Trade Act authorizes the president of the United States to take action against foreign trade practices that violate international trade agreements or burden or restrict U.S. commerce in an unjustifiable, unreasonable, or discriminatory fashion. Action may be initiated by the U.S. Trade Representative (USTR) directly or at the direction of the president, or following a petition from any interested persons, including business or labor. If a petition is filed, the USTR has forty-five days to determine if an investigation is warranted.
Section 301 directs the USTR to seek advice from public and private groups and to consult with the foreign country involved in the dispute as part of its investigation. Most cases are resolved through negotiations with the country whose practices are being questioned. If the USTR finds that unfair trade practices exist and the dispute cannot be resolved through negotiations or through the General Agreement on Tariffs and Trade dispute-settlement procedures, the USTR makes a recommendation to the president of the United States on what action, if any, he should take.

Under Section 301, the president has the authority to take all appropriate and feasible actions within his power to obtain the elimination of unfair trade practices. Specifically, he may impose duties, fees, or restrictions on products and services of the offending country; these goods do not necessarily have to be related to the goods and services which are the subject of the complaint. The president may also deny licenses issued by U.S. federal regulatory agencies to foreign service suppliers. The degree and duration of these actions is determined by the president. (Adapted from a U.S. presidential press release, September 7, 1985.)

References


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